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13. TRUST AGREEMENT

- (i) A trust agreement, as specified in Rule 1200-1-11-.05(8)(n)10 or part (n)10 of this paragraph, must be worded as follows, except that instructions in parentheses are to be replaced with the relevant information and the parentheses deleted:

TRUST AGREEMENT

Trust Agreement, the "Agreement," entered into as of (date) by and between (name of the owner or operator) a (name of State) (insert "corporation," "partnership," "association," or "proprietorship"), the "Grantor," and (name of corporate trustee), (insert "incorporated in the State of _____" or "a national bank"), the "Trustee."

Whereas the Tennessee Solid Waste Disposal Control Board has established certain regulations applicable to the Grantor, requiring that an owner or operator of a hazardous waste management facility or group of facilities must demonstrate financial responsibility for bodily injury and property damage to third parties caused by sudden accidental and/or nonsudden accidental occurrences arising from operations of the facility or group of facilities.

Whereas, the Grantor has elected to establish a trust to assure all or part of such financial responsibility for the facilities identified herein.

Whereas, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this agreement, and the Trustee is willing to act as trustee.

Now, therefore, the Grantor and the Trustee agree as follows:

SECTION 1
DEFINITIONS

As used in this Agreement:

- (I) The term "Grantor" means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.
- (II) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee.

SECTION 2
IDENTIFICATION OF FACILITIES

This agreement pertains to the facilities identified on attached schedule A (on schedule A, for each facility list the EPA Identification Number, name, and address of the facility(ies) and the amount of liability coverage, or portions thereof, if more than one instrument affords combined coverage as demonstrated by this Agreement).

SECTION 3
ESTABLISHMENT OF FUND

The Grantor and the Trustee hereby establish a trust fund, hereinafter the "Fund," for the benefit of any and all third parties injured or damaged by (sudden and/or nonsudden) accidental occurrences arising from operation of the facility(ies) covered by this

guarantee, in the amounts of ____ (up to \$1 million) per occurrence and ____ (up to \$2 million) annual aggregate for sudden accidental occurrences and ____ (up to \$3 million) per occurrence and ____ (up to \$6 million) annual aggregate for nonsudden occurrences, except that the Fund is not established for the benefit of third parties for the following:

- (I) Bodily injury or property damage for which (insert Grantor) is obligated to pay damages by reason of the assumption of liability in a contract or agreement. This exclusion does not apply to liability for damages that (insert Grantor) would be obligated to pay in the absence of the contract or agreement.
- (II) Any obligation of (insert Grantor) under a workers' compensation, disability benefits, or unemployment compensation law or any similar law.
- (III) Bodily injury to:
 - I. An employee of (insert Grantor) arising from, and in the course of, employment by (insert Grantor); or
 - II. The spouse, child, parent, brother or sister of that employee as a consequence of, or arising from, and in the course of employment by (insert Grantor). This exclusion applies:
 - A. Whether (insert Grantor) may be liable as an employer or in any other capacity; and
 - B. To any obligation to share damages with or repay another person who must pay damages because of the injury to persons identified in subitems I and II.
- (IV) Bodily injury or property damage arising out of the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle or watercraft.
- (V) Property damage to:
 - I. Any property owned, rented, or occupied by (insert Grantor);
 - II. Premises that are sold, given away or abandoned by (insert Grantor) if the property damage arises out of any part of those premises;
 - III. Property loaned to (insert Grantor);
 - IV. Personal property in the care, custody or control of (insert Grantor);
 - V. That particular part of real property on which (insert Grantor) or any contractors or subcontractors working directly or indirectly on behalf of (insert Grantor) are performing operations, if the property damage arises out of these operations.

In the event of combination with another mechanism for liability coverage, the fund shall be considered (insert "primary" or "excess") coverage.

The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property

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subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by the Department.

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SECTION 4 PAYMENT FOR BODILY INJURY OR PROPERTY DAMAGE

The Trustee shall satisfy a third party liability claim by making payments from the Fund only upon receipt of one of the following documents:

- (I) Certification from the Grantor and the third party claimant(s) that the liability claim should be paid. The certification must be worded as follows, except that instructions in parentheses are to be replaced with the relevant information and the parentheses deleted.

CERTIFICATION OF VALID CLAIM

The undersigned, as parties (insert Grantor) and (insert name and address of third party claimant(s)), hereby certify that the claim of bodily injury and/or property damage caused by a (sudden or nonsudden) accidental occurrence arising from operating (Grantor's) hazardous waste treatment, storage, or disposal facility should be paid in the amount of \$(_____).

(Signatures) _____
Grantor

(Signatures) _____
Claimant(s)

- (II) A valid final court order establishing a judgment against the Grantor for bodily injury or property damage caused by sudden or nonsudden accidental occurrences arising from the operation of the Grantor's facility or group of facilities.

SECTION 5 PAYMENTS COMPRISING THE FUND

Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee.

SECTION 6 TRUSTEE MANAGEMENT

The Trustee shall invest and reinvest the principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstance then prevailing which persons of prudence, acting in a like capacity and familiar with such

matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

- (I) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a-2.(a), shall not be acquired or held unless they are securities or other obligations of the Federal or a State government;
- (II) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal or State government; and
- (III) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

SECTION 7 COMMINGLING AND INVESTMENT

The Trustee is expressly authorized in its discretion:

- (I) To transfer from time to time any or all of the assets of the Fund to any common commingled or collective trust fund created by the Trustee in which the fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and
- (II) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 81a-1 et seq., including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

SECTION 8 EXPRESS POWERS OF TRUSTEE

Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

- (I) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;
- (II) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;
- (III) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the

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nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

- (IV) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal or State government; and
- (V) To compromise or otherwise adjust all claims in favor of or against the Fund.

SECTION 9 TAXES AND EXPENSES

All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

SECTION 10 ANNUAL VALUATIONS

The Trustee shall annually, at least 30 days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the Division Director a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days prior to the anniversary date of establishment of the Fund. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and the Division Director shall constitute a conclusively binding assent by the Grantor barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

SECTION 11 ADVICE OF COUNSEL

The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

SECTION 12 TRUSTEE COMPENSATION

The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

SECTION 13 SUCCESSOR TRUSTEE

The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and

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this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the Division Director, and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this SECTION shall be paid as provided in SECTION 9.

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SECTION 14 INSTRUCTIONS TO THE TRUSTEE

All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendments to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. All orders, requests, and instructions by the Division Director to the Trustee shall be in writing, signed by the Commissioner of the Tennessee Department of Environment and Conservation or his designee, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or the Department hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or the Department, except as provided for herein.

SECTION 15 NOTICE OF NONPAYMENT

If a payment for bodily injury or property damage is made under SECTION 4 of this trust, the Trustee shall notify the Grantor of such payment and the amount(s) thereof within five (5) working days. The Grantor shall, on or before the anniversary date of the establishment of the Fund following such notice, either make payments to the Trustee in amounts sufficient to cause the trust to return to its value immediately prior to the payment of claims under SECTION 4, or shall provide written proof to the Trustee that other financial assurance for liability coverage has been obtained equalling the amount necessary to return the trust to its value prior to the payment of claims. If the Grantor does not either make payments to the Trustee or provide the Trustee with such proof, the Trustee shall within 10 working days after the anniversary date of the establishment of the Fund provide a written notice of nonpayment to the Division Director.

SECTION 16 AMENDMENT OF AGREEMENT

This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and the Commissioner of the Tennessee Department of Environment and Conservation or his designee, or by the Trustee and the Commissioner of the Tennessee Department of Environment and Conservation or his designee if the Grantor ceases to exist.

SECTION 17

IRREVOCABILITY AND TERMINATION

Subject to the right of the parties to amend this Agreement as provided in SECTION 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and the Commissioner of the Tennessee Department of Environment and Conservation or his designee, or by the Trustee and the Commissioner of the Tennessee Department of Environment and Conservation or his designee, if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

The Commissioner of the Tennessee Department of Environment and Conservation or his designee will agree to termination of the Trust when the owner or operator substitutes alternate financial assurance as specified in this SECTION.

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T**SECTION 18
IMMUNITY AND INDEMNIFICATION

The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or the Commissioner of the Tennessee Department of Environment and Conservation or his designee issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

SECTION 19
CHOICE OF LAW

This Agreement shall be administrated, construed, and enforced according to the laws of the State of (enter name of State).

SECTION 20
INTERPRETATION

As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each SECTION of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

In Witness Whereof the parties have caused this Agreement to be executed by their respective officers duly authorized and their corporate seals to be hereunto affixed and attested as of the date first above written. The parties below certify that the wording of this Agreement is identical to the wording specified in Tennessee Rule 1200-1-11-.06(8)(p)13 as such regulations were constituted on the date first above written.

(Signature of Grantor) _____
(Title) _____

Attest: _____

(Title) _____
(Seal) _____

(Signature of Trustee)_____

Attest:_____

(Title)_____

(Seal)_____

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(ii) CERTIFICATION OF ACKNOWLEDGEMENT

The following is an example of the certification of acknowledgement which must accompany the trust agreement for a trust fund as specified in Rule 1200-1-11-.05(8)(n)10 or part (n)10 of this paragraph. State requirements may differ on the proper content of this acknowledgement.

State of _____

County of _____

On this (date), before me personally came (owner or operator) to me known, who, being by me duly sworn, did depose and say that she/he resides at (address), that she/he is (title) of (corporation), the corporation described in and which executed the above instrument; that she/he knows the seal of said corporation; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that she/he signed her/his name thereto by like order.

Subscribed and sworn to before me this _____ day of _____, ____

Notary Public

My commission expires on the _____ day of _____, ____

* * * * *

14. STANDBY TRUST AGREEMENT

- (i) A standby trust agreement, as specified in Rule 1200-1-11-.05(8)(n)8 or part (n)8 of this paragraph, must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

STANDBY TRUST AGREEMENT

Trust Agreement, the "Agreement," entered into as of [date] by and between [name of the owner or operator] a [name of a State] [insert "corporation," "partnership," "association," or "proprietorship"], the "Grantor," and [name of corporate trustee], [insert, "incorporated in the State of _____" or "a national bank"], the "trustee."

Whereas the Tennessee Solid Waste Disposal Control Board (hereinafter Board) has established certain regulations applicable to the Grantor, requiring that an owner or operator of a hazardous waste management facility or group of facilities must demonstrate financial responsibility for bodily and property damage to third parties caused by sudden accidental and/or nonsudden accidental occurrences arising from operations of the facility or group of facilities.

Whereas, the Grantor has elected to establish a standby trust into which the proceeds from a letter of credit may be deposited to assure all or part of such financial responsibility for the facilities identified herein.

Whereas, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this agreement, and the Trustee is willing to act as trustee.

Now, therefore, the Grantor and the Trustee agree as follows:

SECTION 1 DEFINITIONS

As used in this Agreement:

- (I) The term Grantor means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.
- (II) The term Trustee means the Trustee who enters into this Agreement and any successor Trustee.

SECTION 2 IDENTIFICATION OF FACILITIES

This agreement pertains to the facilities identified on attached schedule A [on schedule A, for each facility list the EPA Identification Number, name, and address of the facility(ies) and the amount of liability coverage, or portions thereof, if more than one instrument affords combined coverage as demonstrated by this Agreement].

SECTION 3 ESTABLISHMENT OF FUND

The Grantor and the Trustee hereby establish a standby trust fund, hereafter the "Fund," for the benefit of any and all third parties injured or damaged by [sudden and/or nonsudden] accidental occurrences arising from operation of the facility(ies) covered by this guarantee, in the amounts of ____ [up to \$1 million] per occurrence and ____ [up to \$2 million] annual aggregate for sudden accidental occurrences and ____ [up to \$3 million] per occurrence and ____ [up to \$6 million] annual aggregate for nonsudden occurrences, except that the Fund is not established for the benefit of third parties for the following:

- (I) Bodily injury or property damage for which [insert Grantor] is obligated to pay damages by reason of the assumption of liability in a contract or agreement. This exclusion does not apply to liability for damages that [insert Grantor] would be obligated to pay in the absence of the contract or agreement.
- (II) Any obligation of [insert Grantor] under a workers' compensation, disability benefits, or unemployment compensation law or any similar law.
- (III) Bodily injury to:
 - I. An employee or [insert Grantor] arising from, and in the course of, employment by [insert Grantor]; or

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- II. The spouse, child, parent, brother or sister of that employee as a consequence of, or arising from, and in the course of employment by [insert Grantor].

This exclusion applies:

- A. Whether [insert Grantor] may be liable as an employer or in any other capacity; and
- B. To any obligation to share damages with or repay another person who must pay damages because of the injury to persons identified in subitems I and II.
- (IV) Bodily injury or property damage arising out of the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle or watercraft.
- (V) Property damage to:
- I. Any property owned, rented, or occupied by [insert Grantor];
- II. Premises that are sold, given away or abandoned by [insert Grantor] if the property damage arises out of any part of those premises;
- III. Property loaned [insert Grantor];
- IV. Personal property in the care, custody or control of [insert Grantor];
- V. That particular part or real property on which [insert Grantor] or any contractors or subcontractors working directly or indirectly on behalf of [insert Grantor] are performing operations, if the property damage arises out of these operations.

In the event of combination with another mechanism for liability coverage, the fund shall be considered [insert "primary" or "excess"] coverage.

The Fund is established initially as consisting of the proceeds of the letter of credit deposited into the Fund. Such proceeds and any other property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established the Board.

SECTION 4 PAYMENT FOR BODILY INJURY OR PROPERTY DAMAGE

The Trustee shall satisfy a third party liability claim by drawing on the letter of credit described in Schedule B and by making payments from the Fund only upon receipt of one of the following documents:

- (I) Certification from the Grantor and the third party claimant(s) that the liability claim should be paid. The certification must be worded as follows, except that

instructions in brackets are to be replaced with the relevant information and the brackets deleted:

Certification of Valid Claim

The undersigned, as parties [insert Grantor] and [insert name and address of third party claimant(s)], hereby certify that the claim of bodily injury and/or property damage caused by a [sudden or nonsudden] accidental occurrence arising from operating [Grantor's] hazardous waste treatment, storage, or disposal facility should be paid in the amount of \$[].

[Signature] _____
Grantor

[Signatures] _____
Claimant(s)

- (II) A valid final court order establishing a judgment against the Grantor for bodily injury or property damage caused by sudden or nonsudden accidental occurrences arising from the operation of the Grantor's facility or group of facilities.

SECTION 5 PAYMENTS COMPRISING THE FUND

Payments made to the Trustee for the Fund shall consist of the proceeds from the letter of credit drawn upon by the Trustee in accordance with the requirements of Tennessee Rule 1200-1-11-.06(8)(p)14 and Section 4 of this Agreement.

SECTION 6 TRUSTEE MANAGEMENT

The Trustee shall invest and reinvest the principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

- (I) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a-2(a), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State government;
- (II) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal or a State government; and
- (III) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

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SECTION 7
COMMINGLING AND INVESTMENT

The Trustee is expressly authorized in its discretion:

- (I) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and
- (II) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a-1 et seq., including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

SECTION 8
EXPRESS POWERS OF TRUSTEE

Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

- (I) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;
- (II) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any all other instruments that may be necessary or appropriate to carry out the powers herein granted;
- (III) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve Bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;
- (IV) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal or State government; and
- (V) To compromise or otherwise adjust all claims in favor of or against the Fund.

SECTION 9
TAXES AND EXPENSES

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All taxes of any kind that may be assessed or levied against or in respect to the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements to the Trustee shall be paid from the Fund.

SECTION 10 ADVICE OF COUNSEL

The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

SECTION 11 TRUSTEE COMPENSATION

The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

SECTION 12 SUCCESSOR TRUSTEE

The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment; the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the Director of the Solid Waste Management Division of the Tennessee Department of Environment and Conservation (TDEC) and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

SECTION 13 INSTRUCTIONS TO THE TRUSTEE

All orders, requests, certifications of valid claims, and instructions to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendments to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or the TDEC hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or TDEC, except as provided for herein.

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AMENDMENT OF AGREEMENT

This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and TDEC, or by the Trustee and TDEC if the Grantor ceases to exist.

SECTION 15
IRREVOCABILITY AND TERMINATION

Subject to the right of the parties to amend this Agreement as provided in Section 14, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and TDEC, or by the Trustee and TDEC, if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be paid to the Grantor.

The Regional Administrator will agree to termination of the Trust when the owner or operator substitutes alternative financial assurance as specified in this SECTION.

SECTION 16
IMMUNITY AND INDEMNIFICATION

The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor and TDEC issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonable incurred in its defense in the event the Grantor fails to provide such defense.

SECTION 17
CHOICE OF LAW

This Agreement shall be administered, construed, and enforced according to the laws of the State of Tennessee.

SECTION 18
INTERPRETATION

As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The description headings for each Section of this Agreement shall not affect the interpretation of the legal efficacy of this Agreement.

In Witness Whereof the parties have caused this Agreement to be executed by their respective officers duly authorized and their corporate seals to be hereunto affixed and attested as of the date first above written. The parties below certify that the wording of this Agreement is identical to the wording specified in Tennessee Rule 1200-1-11-.06(8)(p)14 as such regulations were constituted on the date first above written.

[Signature of Grantor]_____

[Title]_____

Attest:_____

[Title]_____

[Seal]_____

[Signature of Trustee]_____

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Attest: _____
 [Title] _____
 [Seal] _____

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(ii) CERTIFICATION OF ACKNOWLEDGEMENT

The following is an example of the certification of acknowledgement which must accompany the trust agreement for a standby trust fund as specified in Rule 1200-1-11-.05(8)(n)8 or part (n)8 of this paragraph. State requirements may differ on the proper content of this acknowledgement.

State of _____
 County of _____

On this [date], before me personally came [owner or operator] to me known, who, being by me duly sworn, did depose and say that she/he resides at [address], that she/he is [title] of [corporation], the corporation described in and which executed the above instrument; that she/he knows the seal of said corporation; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that she/he signed her/his name thereto by like order.

Subscribed and sworn to before me this _____ day of _____, _____

 Notary Public

My commission expires on the _____ day of _____, _____

* * * * *

15. PERSONAL BOND SUPPORTED BY SECURITIES

Date bond executed: _____

Effective date: _____

Principal: _____ (legal name and address of operator) _____

Type of organization: (insert "individual," "joint venture," "partnership" or "corporation") _____

State of incorporation: _____

E.P.A. I.D. number, name, address, and closure and post-closure amount(s) for each facility guaranteed by this bond (indicate closure and post-closure amounts separately): _____

Total penal sum of bond: _____

Type(s) of Securities: _____

Serial Number(s) of Security(ies): _____

KNOW ALL PERSONS BY THESE PRESENTS, The Principal, hereto are firmly bound to the Tennessee Department of Environment and Conservation (hereinafter called the Department), in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally for the payment of the full amount of the penal sum.

WHEREAS said Principal is required, under the Tennessee Hazardous Waste Management Act as amended (THWMA), to have a permit in order to operate each solid waste disposal facility identified above, and

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WHEREAS said principal is required to provide financial assurance for proper operation, closure and post-closure care as a condition of the permit;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal shall properly operate the solid waste disposal facility and perform closure, whenever required to do so, of each facility for which this bond guarantees proper operation and closure, in accordance with the closure/post-closure plan and other requirements of the permit as such plan and permit may be amended, pursuant to all applicable laws, statutes, rules, and regulations, as such laws, statutes, rules, and regulations may be amended.

AND, if the Principal shall faithfully operate the solid waste disposal facility and perform post-closure care of each facility for which this bond guarantees proper operation, closure and post-closure, in accordance with the closure/post-closure care plan and other requirements of the permit, as such plan and permit may be amended, and pursuant to all applicable laws, statutes, rules, and regulation, as such laws, statutes, rules, and regulations may be amended, the liability of the Principal assumed in the provisioning of this bond shall be discharged. The securities supporting the same and any interest from the securities shall be returned to the Principal upon demand.

Upon notification by the Commissioner that the Principal has been found in violation of his permit, the Act, or Rules promulgated pursuant thereto, the Principal shall, as directed by the Commissioner, operate the facility, perform closure/post-closure in accordance with the closure/post-closure care plan and other permit requirements, or forfeit all or a portion of the penal sum of this bond to the Department.

The Principal hereby waive(s) notification of amendments to closure/post-closure care plans, permits, applicable laws, statutes, rules, and regulations and agrees that no such amendment shall in any way alleviate its (their) obligation on this bond.

The liability of the Principal shall not be discharged by any payment or succession of payments hereunder, unless and until such payment or payments shall amount in the aggregate to the penal sum of the bond.

Initial amount of Security(ies) being assigned to the certification of which is being deposited with the Department \$ _____

The Principal has this day assigned in blank, and deposited with the Department, (list the type of security) _____

The Department is hereby authorized to sell, at public or private sale, said security(ies) if the Principal fails to perform any condition of this bond. The proceeds of any such sale are hereby forfeited to the Department.

The Principal hereto attaches the appropriate demonstration of investment analysis proving that the initial amount of the Security(ies) (as listed in the previous paragraph) \$ _____ will with accrued interest equal or exceed the total penal sum of this bond at the predetermined time of closure of the facility and will provide annual amounts, as accrued, equivalent to the cost of post-closure care annually and summarily for the duration of the post-closure care. The Principal further agrees that at such time as the rate of inflation as published by the United States Department of Commerce exceeds the index on which the investment analysis is herein calculated, that the Principal shall review, along with the Department, whether the amount of the Security(ies) herewith along deposited with the Department along with accrued interest, will at least equal the total amount of the penal sum of the bond, as calculated with the increased rate of inflation. At such time, if it occurs, that the initial amount of the Security(ies) must be increased due to an increased rate of inflation, as published by the U.S. Department of Commerce, the Principal shall so adjust, shall be performed within 60 days of the said publishing of such increase in the national rate of inflation.

IN WITNESS WHEREOF, the Principal has executed this PERFORMANCE BOND and has affixed their seals on the date set forth above.

The persons whose signatures appear below hereby certify that they are authorized to execute this personal bond on behalf of the Principal and that the wording of this personal bond is consistent with Department Rule 1200-1-7-.03(3) as such regulation was constituted on the date this bond was executed.

(Signature(s)) _____
Principal
(Name(s)) _____
(Title(s)) _____
(Corporate seal) _____

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16. *COMBINED HAZARDOUS AND SOLID WASTE FINANCIAL TEST

- (i) Letter From Chief Financial Officer (Closure and/or Post-Closure)
- (ii) Letter From Chief Financial officer (Liability Coverage or Liability Coverage and Closure/Post Closure)
- (iii) Corporate Guarantee for Closure or Post-Closure Care

* Note: Copies of the three financial instrument forms listed above may be obtained by calling the Financial Assurance Office of the Division of Solid Waste Management at 615-532-0780 or writing to :

Attn: Financial Assurance Office
Tennessee Department of Environment & Conservation
Division of Solid Waste Management
L & C Tower, 5th Floor
401 Church Street
Nashville, TN 37243-1535

* * * * *

(9) Use and Management of Containers [40 CFR 264 Subpart I]

(a) Applicability [40 CFR 264.170]

The regulations in this paragraph apply to owners and operators of all hazardous waste facilities that store containers of hazardous waste, except as paragraph (1) of this Rule provides otherwise.

(Comment: Under Rules 1200-1-11-.02(1)(g) and .02(4)(d)3, if a hazardous waste is emptied from a container the residue remaining in the container is not considered a hazardous waste if the container is "empty" as defined in Rule 1200-1-11-.02(1)(g). In that event, management of the container is exempt from the requirements of this paragraph.)

(b) Condition of Containers [40 CFR 264.171]

If a container holding hazardous waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, the owner or operator must transfer the hazardous waste from this container to a container that is in good condition or manage the waste in some other way that complies with the requirements of this Rule.

(c) Compatibility of Waste with Containers [40 CFR 264.172]

The owner or operator must use a container made of or lined with materials which will not react with, and are otherwise compatible with, the hazardous waste to be stored, so that the ability of the container to contain the waste is not impaired.

(d) Management of Containers [40 CFR 264.173]

A container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste.

A container holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.

(Comment: Reuse of containers in transportation is governed by U.S. Department of Transportation regulations including those set forth in 49 CFR 173.28.)

(e) Inspections [40 CFR 264.174]

At least weekly, the owner or operator must inspect areas where containers are stored, looking for leaking containers and for deterioration of containers and the containment system caused by corrosion or other factors.

(Comment: See part (2)(f)3 of this Rule and subparagraph (b) of this paragraph for remedial action required if deterioration or leaks are detected.)

(f) Containment [40 CFR 264.175]

1. Container storage areas must have a containment system that is designed and operated in accordance with part 2 of this subparagraph, except as otherwise provided by part 3 of this subparagraph.
2. A containment system must be designed and operated as follows:
 - (i) A base must underly the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed;
 - (ii) The base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids;
 - (iii) The containment system must have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container, whichever is greater. Containers that do not contain free liquids need not be considered in this determination;

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- (iv) Run-on into the containment system must be prevented unless the collection system has sufficient excess capacity in addition to that required in subpart (iii) of this part to contain any run-on which might enter the system; and
- (v) Spilled or leaked waste and accumulated precipitation must be removed from the sump or collection area in as timely a manner as is necessary to prevent overflow of the collection system.

(Comment: If the collected material is a hazardous waste under Rule 1200-1-11-.02, it must be managed as a hazardous waste in accordance with all applicable requirements of Rules 1200-1-11-.03 through .07 and .09. If the collected material is discharged through a point source to waters of the United States, it is subject to the requirements of section 402 of the Clean Water Act, as amended.)

- 3. Storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system defined by part 2 of this subparagraph, except as provided by part 4 of this subparagraph or provided that:
 - (i) The storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation, or
 - (ii) The containers are elevated or are otherwise protected from contact with accumulated liquid.
- 4. Storage areas that store containers holding the wastes listed below that do not contain free liquids must have a containment system defined by part 2 of this subparagraph:
 - (i) F020, F021, F022, F023, F026, and F027.
 - (ii) (Reserved)

(g) Special Requirements for Ignitable or Reactive Waste [40 CFR 264.176]

Containers holding ignitable or reactive waste must be located at least 15 meters (50 feet) from the facility's property line.

(Comment: See part (2)(h)1 of this Rule for additional requirements.)

(h) Special requirements for Incompatible Wastes [40 CFR 264.177]

- 1. Incompatible wastes, or incompatible wastes and materials (see Appendix V in paragraph (57) of this Rule for examples), must not be placed in the same container, unless part (2)(h)2 of this Rule is complied with.
- 2. Hazardous waste must not be placed in an unwashed container that previously held an incompatible waste or material.

(Comment: As required by subparagraph (2)(d) of this Rule, the waste analysis plan must include analyses needed to comply with this subparagraph. Also, part (2)(h)3 of this Rule requires wastes analyses, trial tests or other documentation to assure compliance with part (2)(h)2 of this Rule. As required by subparagraph (5)(d) of this Rule, the owner or operator must place the results of each waste analysis and trial test, and any documented information, in the operating record of the facility.)

- 3. A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface

impoundments must be separated from the other materials or protected from them by means of a dike, berm, wall, or other device.

(Comment: The purpose of this section is to prevent fires, explosions, gaseous emission, leaching, or other discharge of hazardous waste or hazardous waste constituents which could result from the mixing of incompatible wastes or materials if containers break or leak.)

(i) Closure [40 CFR 264.178]

At closure, all hazardous waste and hazardous waste residues must be removed from the containment system. Remaining containers, liners, bases, and soil containing or contaminated with hazardous waste or hazardous waste residues must be decontaminated or removed.

(Comment: At closure, as throughout the operating period, unless the owner or operator can demonstrate in accordance with Rule 1200-1-11-.02(1)(c)4 that the solid waste removed from the containment system is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with all applicable requirements of Rule 1200-1-11-.03 through .07 and .09.)

(j) Air Emission Standards [40 CFR 264.179]

The owner or operator shall manage all hazardous waste placed in a container in accordance with the applicable requirements of paragraphs (30), (31), and (32) of this Rule.

(10) Tank Systems [40 CFR 264 Subpart J]

(a) Applicability [40 CFR 264.190]

The requirements of this paragraph apply to owners and operators of facilities that use tank systems for storing or treating hazardous waste except as otherwise provided in parts 1,2 and 3 of this subparagraph or in paragraph (1) of this Rule.

1. Tank systems that are used to store or treat hazardous waste which contains no free liquids and are situated inside a building with an impermeable floor are exempted from the requirements in subparagraph (d) of this paragraph. To demonstrate the absence or presence of free liquids in the stored/treated waste, the following test listed in Rule 1200-1-11-.01(2)(b) must be used: Method 9095 (Paint Filter Liquids Test) as described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846.
2. Tank systems, including sumps, as defined in Rule 1200-1-11-.01(2)(a), that serve as part of a secondary containment system to collect or contain releases of hazardous wastes are exempted from the requirements in part (d)1 of this paragraph.
3. Tanks, sumps, and other such collection devices or systems used in conjunction with drip pads, as defined in Rule 1200-1-11-.01(2)(a) and regulated under paragraph (26) of this Rule, must meet the requirements of this paragraph.

(b) Assessment of Existing Tank System's Integrity [40 CFR 264.191]

1. For each existing tank system that does not have secondary containment meeting the requirements of subparagraph (10)(d) of this Rule, the owner or operator must determine that the tank system is not leaking or is unfit for use. Except as provided in part 3 of this subparagraph, the owner or operator must obtain and keep on file at the facility a written assessment reviewed and certified by an independent, qualified registered professional

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engineer, in accordance with Rule 1200-1-11-.07(2)(a)10, that attests to the tank system's integrity by January 12, 1988.

2. This assessment must determine that the tank system is adequately designed and has sufficient structural strength and compatibility with the waste(s) to be stored or treated, to ensure that it will not collapse, rupture, or fail. At a minimum, this assessment must consider the following:
 - (i) Design standard(s), if available, according to which the tank and ancillary equipment were constructed;
 - (ii) Hazardous characteristics of the waste(s) that have been and will be handled;
 - (iii) Existing corrosion protection measures;
 - (iv) Documented age of the tank system, if available (otherwise, an estimate of the age); and
 - (v) Results of a leak test, internal inspection, or other tank integrity examination such that:
 - (I) For non-enterable underground tanks, the assessment must include a leak test that is capable of taking into account the effects of temperature variations, tank end deflection, vapor pockets, and high water table effects, and
 - (II) For other than non-enterable underground tanks and for ancillary equipment, this assessment must include either a leak test, as described above, or other integrity examination, that is certified by an independent, qualified, registered professional engineer in accordance with Rule 1200-1-11-.07(2)(a)10 that addresses cracks, leaks, corrosion, and erosion.

(Note: The practices described in the American Petroleum Institute (API) Publication, Guide for Inspection of Refinery Equipment, Chapter XIII, "Atmospheric and Low-Pressure Storage Tanks," 4th edition, 1981, may be used, where applicable, as guidelines in conducting other than a leak test.)

3. Tank systems that store or treat materials that become hazardous wastes subsequent to July 14, 1986, must conduct this assessment within 12 months after the date that the waste becomes a hazardous waste.
 4. If, as a result of the assessment conducted in accordance with part 1 of this subparagraph, a tank system is found to be leaking or unfit for use, the owner or operator must comply with the requirements of subparagraph (g) of this paragraph.
- (c) Design and Installation of New Tank Systems or Components [40 CFR 264.192]
1. Owners or operators of new tank systems or components must obtain and submit to the Commissioner, at time of submittal of Part B information, a written assessment, reviewed and certified by an independent, qualified registered professional engineer, in accordance with Rule 1200-1-11-.07(2)(a)10, attesting that the tank system has sufficient structural integrity and is acceptable for the storing and treating of hazardous waste. The assessment must show that the foundation, structural support, seams, connections, and pressure controls (if applicable) are adequately designed and that the tank system has

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sufficient structural strength, compatibility with the waste(s) to be stored or treated, and corrosion protection to ensure that it will not collapse, rupture, or fail. This assessment, which will be used by the Commissioner to review and approve or disapprove the acceptability of the tank system design, must include, at a minimum, the following information:

- (i) Design standard(s) according to which tank(s) and/or the ancillary equipment are constructed;
- (ii) Hazardous characteristics of the waste(s) to be handled;
- (iii) For new tank systems or components in which the external shell of a metal tank or any external metal component of the tank system will be in contact with the soil or with water, a determination by a corrosion expert of:
 - (I) Factors affecting the potential for corrosion, including but not limited to:
 - I. Soil moisture content;
 - II. Soil pH;
 - III. Soil sulfides level;
 - IV. Soil resistivity;
 - V. Structure to soil potential;
 - VI. Influence of nearby underground metal structures (e.g., piping);
 - VII. Existence of stray electric current;
 - VIII. Existing corrosion-protection measures (e.g., coating, cathodic protection), and
 - (II) The type and degree of external corrosion protection that are needed to ensure the integrity of the tank system during the use of the tank system or component, consisting of one or more of the following:
 - I. Corrosion-resistant materials of construction such as special alloys, fiberglass reinforced plastic, etc.;
 - II. Corrosion-resistant coating (such as epoxy, fiberglass, etc.) with cathodic protection (e.g., impressed current or sacrificial anodes); and
 - III. Electrical isolation devices such as insulating joints, flanges, etc.

(Note: The practices described in the National Association of Corrosion Engineers (NACE) standard, "Recommended Practice (RP-02-85) -- Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems," and the American Petroleum Institute (API) Publication 1632, "Cathodic

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Protection of Underground Petroleum Storage Tanks and Piping Systems," may be used, where applicable, as guidelines in providing corrosion protection for tank systems.)

- (iv) For underground tank system components that are likely to be adversely affected by vehicular traffic, a determination of design or operational measures that will protect the tank system against potential damage; and
- (v) Design considerations to ensure that:
 - (I) Tank foundations will maintain the load of a full tank;
 - (II) Tank systems will be anchored to prevent flotation or dislodgment where the tank system is placed in a saturated zone, or is located within a seismic fault zone subject to the standards of part (2)(i)1 of this Rule; and
 - (III) Tank systems will withstand the effects of frost heave.

2. The owner or operator of a new tank system must ensure that proper handling procedures are adhered to in order to prevent damage to the system during installation. Prior to covering, enclosing, or placing a new tank system or component in use, an independent, qualified installation inspector or an independent, qualified, registered professional engineer, either of whom is trained and experienced in the proper installation of tank systems or components, must inspect the system for the presence of any of the following items:

- (i) Weld breaks;
- (ii) Punctures;
- (iii) Scrapes of protective coatings;
- (iv) Cracks;
- (v) Corrosion;
- (vi) Other structural damage or inadequate construction/installation.

All discrepancies must be remedied before the tank system is covered, enclosed, or placed in use.

3. New tank systems or components that are placed underground and that are backfilled must be provided with a backfill material that is a noncorrosive, porous, homogeneous substance and that is installed so that the backfill is placed completely around the tank and compacted to ensure that the tank and piping are fully and uniformly supported.
4. All new tanks and ancillary equipment must be tested for tightness prior to being covered, enclosed, or placed in use. If a tank system is found not to be tight, all repairs necessary to remedy the leak(s) in the system must be performed prior to the tank system being covered, enclosed, or placed into use.
5. Ancillary equipment must be supported and protected against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

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(Note: The piping system installation procedures described in American Petroleum Institute (API) Publication 1615 (November 1979), "Installation of Underground Petroleum Storage Systems," or ANSI Standard B31.3, "Petroleum Refinery Piping," and ANSI Standard B31.4 "Liquid Petroleum Transportation Piping System," may be used, where applicable, as guidelines for proper installation of piping systems.)

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6. The owner or operator must provide the type and degree of corrosion protection recommended by an independent corrosion expert, based on the information provided under subpart 1(iii) of this subparagraph, or other corrosion protection if the Commissioner believes other corrosion protection is necessary to ensure the integrity of the tank system during use of the tank system. The installation of a corrosion protection system that is field fabricated must be supervised by an independent corrosion expert to ensure proper installation.
7. The owner or operator must obtain and keep on file at the facility written statements by those persons required to certify the design of the tank system and supervise the installation of the tank system in accordance with the requirements of parts 2 through 6 of this subparagraph, that attest that the tank system was properly designed and installed and that repairs, pursuant to parts 2 and 4 of this subparagraph, were performed. These written statements must also include the certification statement as required in Rule 1200-1-11-.07(2)(a)10.

(d) Containment and Detection of Releases [40 CFR 264.193]

1. In order to prevent the release of hazardous waste or hazardous constituents to the environment, secondary containment that meets the requirements of this section must be provided (except as provided in parts 6 and 7 of this subparagraph):
 - (i) For all new tank systems or components, prior to their being put into service;
 - (ii) For all existing tank systems used to store or treat EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027, within two years after January 12, 1987;
 - (iii) For those existing tank systems of known and documented age, within two years after January 12, 1987 or when the tank system has reached 15 years of age, whichever comes later;
 - (iv) For those existing tank systems for which the age cannot be documented, within eight years of January 12, 1987; but if the age of the facility is greater than seven years, secondary containment must be provided by the time the facility reaches 15 years of age, or within two years of January 12, 1987, whichever comes later; and
 - (v) For tank systems that store or treat materials that become hazardous wastes subsequent to January 12, 1987, within the time intervals required in subparts 1(i) through (iv) of this subparagraph, except that the date that a material becomes a hazardous waste must be used in place of January 12, 1987.
2. Secondary containment systems must be:
 - (i) Designed, installed, and operated to prevent any migration of wastes or accumulated liquid out of the system to the soil, ground water, or surface water at any time during the use of the tank system; and

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- (ii) Capable of detecting and collecting releases and accumulated liquids until the collected material is removed.
- 3. To meet the requirements of part 2 of this subparagraph, secondary containment systems must be at a minimum:
 - (i) Constructed of or lined with materials that are compatible with the wastes(s) to be placed in the tank system and must have sufficient strength and thickness to prevent failure owing to pressure gradients (including static head and external hydrological forces), physical contact with the waste to which it is exposed, climatic conditions, and the stress of daily operation (including stresses from nearby vehicular traffic).
 - (ii) Placed on a foundation or base capable of providing support to the secondary containment system, resistance to pressure gradients above and below the system, and capable of preventing failure due to settlement, compression, or uplift;
 - (iii) Provided with a leak-detection system that is designed and operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours, or at the earliest practicable time if the owner or operator can demonstrate to the Commissioner that existing detection technologies or site conditions will not allow detection of a release within 24 hours; and
 - (iv) Sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills, or precipitation. Spilled or leaked waste and accumulated precipitation must be removed from the secondary containment system within 24 hours, or in as timely a manner as is possible to prevent harm to human health and the environment, if the owner or operator can demonstrate to the Commissioner that removal of the released waste or accumulated precipitation cannot be accomplished within 24 hours.

(Note: If the collected material is a hazardous waste under Rule 1200-1-11-.02, it is subject to management as a hazardous waste in accordance with all applicable requirements of Rules 1200-1-11-.03 through .06. If the collected material is discharged through a point source to waters of the United States, it is subject to the requirements of sections 301, 304, and 402 of the Clean Water Act, as amended. If discharged to a Publicly Owned Treatment Works (POTW), it is subject to the requirements of section 307 of the Clean Water Act, as amended. If the collected material is released to the environment, it may be subject to the reporting requirements of 40 CFR part 302.)

- 4. Secondary containment for tanks must include one or more of the following devices:
 - (i) A liner (external to the tank);
 - (ii) A vault;
 - (iii) A double-walled tank; or
 - (iv) An equivalent device as approved by the Commissioner.
- 5. In addition to the requirements of parts 2,3, and 4 of this subparagraph, secondary containment systems must satisfy the following requirements:

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- (i) External liner systems must be:
 - (I) Designed or operated to contain 100 percent of the capacity of the largest tank within its boundary;
 - (II) Designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity to contain run-on or infiltration. Such additional capacity must be sufficient to contain precipitation from a 25-year, 24-hour rainfall event.
 - (III) Free of cracks or gaps; and
 - (IV) Designed and installed to surround the tank completely and to cover all surrounding earth likely to come into contact with the waste if the waste is released from the tank(s) (i.e., capable of preventing lateral as well as vertical migration of the waste).
- (ii) Vault systems must be:
 - (I) Designed or operated to contain 100 percent of the capacity of the largest tank within its boundary;
 - (II) Designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity to contain run-on or infiltration. Such additional capacity must be sufficient to contain precipitation from a 25-year, 24-hour rainfall event;
 - (III) Constructed with chemical-resistant water stops in place at all joints (if any);
 - (IV) Provided with an impermeable interior coating or lining that is compatible with the stored waste and that will prevent migration of waste into the concrete;
 - (V) Provided with a means to protect against the formation of and ignition of vapors within the vault, if the waste being stored or treated:
 - I. Meets the definition of ignitable waste under Rule 1200-1-11-.02(3)(b); or
 - II. Meets the definition of reactive waste under Rule 1200-1-11-.02(3)(d), and may form an ignitable or explosive vapor.
 - (VI) Provided with an exterior moisture barrier or be otherwise designed or operated to prevent migration of moisture into the vault if the vault is subject to hydraulic pressure.
- (iii) Double-walled tanks must be:
 - (I) Designed as an integral structure (i.e., an inner tank completely enveloped within an outer shell) so that any release from the inner tank is contained by the outer shell.

- (II) Protected, if constructed of metal, from both corrosion of the primary tank interior and of the external surface of the outer shell: and
- (III) Provided with a built-in continuous leak detection system capable of detecting a release within 24 hours, or at the earliest practicable time, if the owner or operator can demonstrate to the Commissioner, and the Commissioner concludes, that the existing detection technology or site conditions would not allow detection of a release within 24 hours.

(Note: The provisions outlined in the Steel Tank Institute's (STI) "Standard for Dual Wall Underground Steel Storage Tanks" may be used as guidelines for aspects of the design of underground steel double-walled tanks.)

- 6. Ancillary equipment must be provided with secondary containment (e.g., trench, jacketing, double-walled piping) that meets the requirements of parts 2 and 3 of this subparagraph except for:
 - (i) Aboveground piping (exclusive of flanges, joints, valves, and other connections) that are visually inspected for leaks on a daily basis;
 - (ii) Welded flanges, welded joints, and welded connections, that are visually inspected for leaks on a daily basis;
 - (iii) Sealless or magnetic coupling pumps and sealless valves, that are visually inspected for leaks on a daily basis; and
 - (iv) Pressurized aboveground piping systems with automatic shut-off devices (e.g., excess flow check valves, flow metering shutdown devices, loss of pressure actuated shut-off devices) that are visually inspected for leaks on a daily basis.
- 7. The owner or operator may obtain a variance from the requirements of this paragraph if the Commissioner finds, as a result of a demonstration by the owner or operator that alternative design and operating practices, together with location characteristics, will prevent the migration of any hazardous waste or hazardous constituents into the ground water; or surface water at least as effectively as secondary containment during the active life of the tank system or that in the event of a release that does migrate to ground water or surface water, no substantial present or potential hazard will be posed to human health or the environment. New underground tank systems may not, per a demonstration in accordance with subpart (ii) of this part, be exempted from the secondary containment requirements of this subparagraph.
 - (i) In deciding whether to grant a variance based on a demonstration of equivalent protection of ground water and surface water, the Commissioner will consider:
 - (I) The nature and quantity of the wastes;
 - (II) The proposed alternate design and operation;
 - (III) The hydrogeologic setting of the facility, including the thickness of soils present between the tank system and ground water, and
 - (IV) All other factors that would influence the quality and mobility of the hazardous constituents and the potential for them to migrate to ground water or surface water

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- (ii) In deciding whether to grant a variance based on a demonstration of no substantial present or potential hazard, the Commissioner will consider:
- (I) The potential adverse effects on ground water, surface water, and land quality taking into account:
 - I. The physical and chemical characteristics of the waste in the tank system, including its potential for migration.
 - II. The hydrogeological characteristics of the facility and surrounding land,
 - III. The potential for health risks caused by human exposure to waste constituents,
 - IV. The potential for damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents, and
 - V. The persistence and permanence of the potential adverse effects;
 - (II) The potential adverse effects of a release on ground-water quality, taking into account:
 - I. The quantity and quality of ground water and the direction of ground-water flow,
 - II. The proximity and withdrawal rates of ground-water users,
 - III. The current and future uses of ground water in the area, and
 - IV. The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground-water quality;
 - (III) The potential adverse effects of a release on surface water quality, taking into account:
 - I. The quantity and quality of ground water and the direction of ground-water flow,
 - II. The patterns of rainfall in the region,
 - III. The proximity of the tank system to surface waters,
 - IV. The current and future uses of surface waters in the area and any water quality standards established for those surface waters, and
 - V. The existing quality of surface water, including other sources of contamination and the cumulative impact on surface-water quality; and

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- (IV) The potential adverse effects of a release on the land surrounding the tank system, taking into account:
 - I. The patterns of rainfall in the region, and
 - II. The current and future uses of the surrounding land.
- (iii) The owner or operator of a tank system, for which a variance from secondary containment had been granted in accordance with the requirements of subpart (i) of this part, at which a release of hazardous waste has occurred from the primary tank system but has not migrated beyond the zone of engineering control (as established in the variance), must:
 - (I) Comply with the requirements of subparagraph (g) of this paragraph, except part 4; and
 - (II) Decontaminate or remove contaminated soil to the extent necessary to:
 - I. Enable the tank system for which the variance was granted to resume operation with the capability for the detection of releases at least equivalent to the capability it had prior to the release; and
 - II. Prevent the migration of hazardous waste or hazardous constituents to ground water or surface water; and
 - (III) If contaminated soil cannot be removed or decontaminated in accordance with item (II) of this subpart, comply with the requirement of part (h)2 of this paragraph.
- (iv) The owner or operator of a tank system, for which a variance from secondary containment had been granted in accordance with the requirements of subpart (i) of this part, at which a release of hazardous waste has occurred from the primary tank system and has migrated beyond the zone of engineering control (as established in the variance), must:
 - (I) Comply with the requirements of parts (g)1 through (g)4 of this paragraph; and
 - (II) Prevent the migration of hazardous waste or hazardous constituents to ground water or surface water, if possible, and decontaminate or remove contaminated soil. If contaminated soil cannot be decontaminated or removed or if ground water has been contaminated, the owner or operator must comply with the requirements of part (h) 2 of this paragraph; and
 - (III) If repairing, replacing, or reinstalling the tank system, provide secondary containment in accordance with the requirements of parts 1 through 6 of this subparagraph or reapply for a variance from secondary containment and meet the requirements for new tank systems in subparagraph (c) of this paragraph if the tank system is replaced. The owner or operator must comply with these requirements

even if contaminated soil can be decontaminated or removed and ground water or surface water has not been contaminated.

8. The following procedures must be followed in order to request a variance from secondary containment:
- (i) The Commissioner must be notified in writing by the owner or operator that he intends to conduct and submit a demonstration for a variance from secondary containment as allowed in part 7 of this subparagraph according to the following schedule:
 - (I) For existing tank systems, at least 24 months prior to the date that secondary containment must be provided in accordance with part 1 of this subparagraph..
 - (II) For new tank systems, at least 30 days prior to entering into a contract for installation.
 - (ii) As part of the notification, the owner or operator must also submit to Commissioner a description of the steps necessary to conduct the demonstration and a timetable for completing each of the steps. The demonstration must address each of the factors listed in subparts 7(1) or 7(ii) of this subparagraph;
 - (iii) The demonstration for a variance must be completed within 180 days after notifying the Commissioner of an intent to conduct the demonstration; and
 - (iv) If a variance is granted under this paragraph, the Commissioner will require the permittee to construct and operate the tank system in the manner that was demonstrated to meet the requirements for the variance.
9. All tank systems, until such time as secondary containment that meets the requirements of this subparagraph is provided, must comply with the following:
- (i) For non-enterable underground tanks, a leak test that meets the requirements of subpart (b)2(v) of this paragraph or other tank integrity method, as approved or required by the Commissioner, must be conducted at least annually.
 - (ii) For other than non-enterable underground tanks, the owner or operator must either conduct a leak test as in subpart (i) of this part or develop a schedule and procedure for an assessment of the overall condition of the tank system by an independent, qualified registered professional engineer. The schedule and procedure must be adequate to detect obvious cracks, leaks, and corrosion or erosion that may lead to cracks and leaks. The owner or operator must remove the stored waste from the tank, if necessary, to allow the condition of all internal tank surfaces to be assessed. The frequency of these assessments must be based on the material of construction of the tank and its ancillary equipment, the age of the system, the type of corrosion or erosion protection used, the rate of corrosion or erosion observed during the previous inspection, and the characteristics of the waste being stored or treated.
 - (iii) For ancillary equipment, a leak test or other integrity assessment as approved by the Commissioner must be conducted at least annually.

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(Note: The practices described in the American Petroleum Institute (API) Publication Guide for Inspection of Refinery Equipment, Chapter XIII, "Atmospheric and Low-Pressure Storage Tanks," 4th edition, 1981, may be used, where applicable, as guidelines for assessing the overall condition of the tank system.)

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- (iv) The owner or operator must maintain on file at the facility a record of the results of the assessments conducted in accordance with subparts (i) through (iii) of this part.
 - (v) If a tank system or component is found to be leaking or unfit for use as a result of the leak test or assessment in subparts (i) through (iii) of this part, the owner or operator must comply with the requirements of subparagraph (g) of this paragraph.
- (e) General Operating Requirements [40 CFR 264.194]
 - 1. Hazardous wastes or treatment reagents must not be placed in a tank system if they could cause the tank, its ancillary equipment, or the containment system to rupture, leak, corrode, or otherwise fail.
 - 2. The owner or operator must use appropriate controls and practices to prevent spills and overflows from tank or containment systems. These include at a minimum:
 - (i) Spill prevention controls (e.g., check valves, dry disconnect couplings);
 - (ii) Overfill prevention controls (e.g., level sensing devices, high level alarms, automatic feed cutoff, or bypass to a standby tank); and
 - (iii) Maintenance of sufficient freeboard in uncovered tanks to prevent overtopping by wave or wind action or by precipitation.
 - 3. The owner or operator must comply with the requirements of subparagraph (g) of this paragraph if a leak or spill occurs in the tank system.
- (f) Inspections [40 CFR 264.195]
 - 1. The owner or operator must develop and follow a schedule and procedure for inspecting overfill controls.
 - 2. The owner or operator must inspect at least once each operating day:
 - (i) Aboveground portions of the tank system, if any, to detect corrosion or releases of waste;
 - (ii) Data gathered from monitoring and leak detection equipment (e.g., pressure or temperature gauges, monitoring wells) to ensure that the tank system is being operated according to its design; and
 - (iii) The construction materials and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system (e.g., dikes) to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation).

(Note: Part (2)(f)3 of this Rule requires the owner or operator to remedy any deterioration or malfunction he finds. Subparagraph (g) of this paragraph requires the owner or operator to notify the Commissioner within 24 hours of

confirming a leak. Also, Federal 40 CFR part 302 may require the owner or operator to notify the National Response Center of a release and Section 304 of Title III of the Superfund Amendments and Reauthorization Act of 1986 may require notification of the Tennessee Emergency Management Agency.)

3. The owner or operator must inspect cathodic protection systems, if present, according to, at a minimum, the following schedule to ensure that they are functioning properly:
 - (i) The proper operation of the cathodic protection system must be confirmed within six months after initial installation and annually thereafter; and
 - (ii) All sources of impressed current must be inspected and/or tested, as appropriate, at least bimonthly (i.e., every other month).

(Note: The practices described in the National Association of Corrosion Engineers (NACE) standard, "Recommended Practice (RP-02-85) -- Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems," and the American Petroleum Institute (API) Publication 1632, "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems," may be used, where applicable, as guidelines in maintaining and inspecting cathodic protection systems.)

4. The owner or operator must document in the operating record of the facility an inspection of those items in parts 1 through 3 of this subparagraph.

- (g) Response to Leaks or Spills and Disposition of Leaking or Unfit-for-use Tank Systems [40 CFR 264.196]

A tank system or secondary containment system from which there has been a leak or spill, or which is unfit for use, must be removed from service immediately, and the owner or operator must satisfy the following requirements:

1. Cessation of use; prevent flow or addition of wastes

The owner or operator must immediately stop the flow of hazardous waste into the tank system or secondary containment system and inspect the system to determine the cause of the release.

2. Removal of waste from tank system or secondary containment system

- (i) If the release was from the tank system, the owner/operator must, within 24 hours after detection of the leak or, if the owner/operator demonstrates that it is not possible, at the earliest practicable time, remove as much of the waste as is necessary to prevent further release of hazardous waste to the environment and to allow inspection and repair of the tank system to be performed.
- (ii) If the material released was to a secondary containment system, all released materials must be removed within 24 hours or in as timely a manner as is possible to prevent harm to human health and the environment.

3. Containment of visible releases to the environment

The owner/operator must immediately conduct a visual inspection of the release and, based upon that inspection:

- (i) Prevent further migration of the leak or spill to soils or surface water; and

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- (ii) Remove, and properly dispose of, any visible contamination of the soil or surface water.
- 4. Notifications, reports
 - (i) Any release to the environment, except as provided in subpart 4(ii) of this subparagraph, must be reported to the Commissioner within 24 hours of its detection. If the release has been reported to the National Response Center pursuant to Federal 40 CFR part 302 or to the Tennessee Emergency Management Agency that report will satisfy this requirement.
 - (ii) A leak or spill of hazardous waste is exempted from the requirements of this part if it is:
 - (I) Less than or equal to a quantity of one (1) pound, and
 - (II) Immediately contained and cleaned up.
 - (iii) Within 30 days of detection of a release to the environment, a report containing the following information must be submitted to the Division Director:
 - (I) Likely route of migration of the release;
 - (II) Characteristics of the surrounding soil (soil composition, geology, hydrogeology, climate);
 - (III) Results of any monitoring or sampling conducted in connection with the release (if available). If sampling or monitoring data relating to the release are not available within 30 days, these data must be submitted to the Division Director as soon as they become available.
 - (IV) Proximity to downgradient drinking water, surface water, and populated areas; and
 - (V) Description of response actions taken or planned.
- 5. Provision of secondary containment, repair, or closure
 - (i) Unless the owner/operator satisfies the requirements of subparts (ii) through (iv) of this part, the tank system must be closed in accordance with subparagraph (h) of this paragraph.
 - (ii) If the cause of the release was a spill that has not damaged the integrity of the system, the owner/operator may return the system to service as soon as the released waste is removed and repairs, if necessary, are made.
 - (iii) If the cause of the release was a leak from the primary tank system into the secondary containment system, the system must be repaired prior to returning the tank system to service.
 - (iv) If the source of the release was a leak to the environment from a component of a tank system without secondary containment, the owner/operator must provide the component of the system from which the leak occurred with secondary containment that satisfies the requirements of subparagraph (d) of this paragraph

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before it can be returned to service, unless the source of the leak is an aboveground portion of a tank system that can be inspected visually. If the source is an aboveground component that can be inspected visually, the component must be repaired and may be returned to service without secondary containment as long as the requirements of part 6 of this subparagraph are satisfied. If a component is replaced to comply with the requirements of this subparagraph, that component must satisfy the requirements for new tank systems or components in subparagraphs (c) and (d) of this paragraph. Additionally, if a leak has occurred in any portion of a tank system component that is not readily accessible for visual inspection (e.g., the bottom of an inground or onground tank), the entire component must be provided with secondary containment in accordance with subparagraph (d) of this paragraph prior to being returned to use.

6. Certification of major repairs

If the owner/operator has repaired a tank system in accordance with part 5 of this subparagraph, and the repair has been extensive (e.g., installation of an internal liner; repair of a ruptured primary containment or secondary containment vessel), the tank system must not be returned to service unless the owner/operator has obtained a certification by an independent, qualified, registered, professional engineer in accordance with Rule 1200-1-11-.07(2)(a)10 that the repaired system is capable of handling hazardous wastes without release for the intended life of the system. This certification must be submitted to the Division Director within seven days after returning the tank system to use.

(Note: The Commissioner may, on the basis of any information received that there is or has been a release of hazardous waste or hazardous constituents into the environment, issue an order under T.C.A. §68-212-111 requiring corrective action or such other response as deemed necessary to protect human health or the environment.)

(Note: See part (2)(f)3 of this Rule for the requirements necessary to remedy a failure. Also, Federal 40 CFR part 302 may require the owner or operator to notify the National Response Center of certain releases and Section 304 of Title III of the Superfund Amendments and Reauthorization Act of 1986 may require notification of the Tennessee Emergency Management Agency.)

(h) Closure and Post-closure Care [40 CFR 264.197]

1. At closure of a tank system, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated soils, and structures and equipment contaminated with waste, and manage them as hazardous waste, unless Rule 1200-1-11-.02(1)(c)4 applies. The closure plan, closure activities, cost estimates for closure, and financial responsibility for tank systems must meet all of the requirements specified in paragraphs (7) and (8) of this Rule.
2. If the owner or operator demonstrates that not all contaminated soils can be practicably removed or decontaminated as required in part 1 of this subparagraph, then the owner or operator must close the tank system and perform post-closure care in accordance with the closure and post-closure care requirements that apply to landfills subparagraph (14)(k) of this Rule. In addition, for the purposes of closure, post-closure, and financial responsibility, such a tank system is then considered to be a landfill, and the owner or operator must meet all of the requirements for landfills specified in paragraphs (7) and (8) of this Rule.

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3. If an owner or operator has a tank system that does not have secondary containment that meets the requirements of parts (d)2 through (d)6 of this paragraph and has not been granted a variance from the secondary containment requirements in accordance with part (d)7 of this paragraph, then:
 - (i) The closure plan for the tank system must include both a plan for complying with part 1 of this subparagraph and a contingent plan for complying with part 2 of this subparagraph.
 - (ii) A contingent post-closure plan for complying with part 2 of this subparagraph must be prepared and submitted as part of the permit application.
 - (iii) The cost estimates calculated for closure and post-closure care must reflect the costs of complying with the contingent closure plan and the contingent post-closure plan, if those costs are greater than the costs of complying with the closure plan prepared for the expected closure under part 1 of this subparagraph.
 - (iv) Financial assurance must be based on the cost estimates in subpart (iii) of this part.
 - (v) For the purposes of the contingent closure and post-closure plans, such a tank system is considered to be a landfill, and the contingent plans must meet all of the closure, post-closure, and financial responsibility requirements for landfills under paragraphs (7) and (8) of this Rule.
- (i) Special Requirements for Ignitable or Reactive Wastes [40 CFR 264.198]
 1. Ignitable or reactive waste must not be placed in tank systems, unless:
 - (i) The waste is treated, rendered, or mixed before or immediately after placement in the tank system so that:
 - (I) The resulting waste, mixture, or dissolved material no longer meets the definition of ignitable or reactive waste under paragraph (3)(b) or (3)(d) of Rule 1200-1-11-.02, and
 - (II) Part (2)(h)2 of this Rule is complied with; or
 - (ii) The waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to ignite or react; or
 - (iii) The tank system is used solely for emergencies.
 2. The owner or operator of a facility where ignitable or reactive waste is stored or treated in a tank must comply with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjoining property line that can be built upon as required in Tables 2-1 through 2-6 of the National Fire Protection Association's "Flammable and Combustible Liquids Code" (1977 or 1981) (see Rule 1200-1-11-.01(2)(b)).
- (j) Special Requirements for Incompatible Wastes [40 CFR 264.199]
 1. Incompatible wastes, or incompatible wastes and materials, must not be placed in the same tank system, unless part (2)(h)2 of this Rule is complied with.

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2. Hazardous waste must not be placed in a tank system that has not been decontaminated and that previously held an incompatible waste or material, unless part (2)(h)2 of this Rule is complied with.

(k) Air Emission Standards [40 CFR 264.200]

The owner or operator shall manage all hazardous waste placed in a tank in accordance with the applicable requirements of paragraphs (30), (31), and (32) of this Rule.

(11) Surface Impoundments [40 CFR 264 Subpart K]

(a) Applicability [40 CFR 264.220]

The regulations in this paragraph apply to owners and operators of facilities that use surface impoundments to treat, store, or dispose of hazardous waste except as subparagraphs (1)(b) and (1)(d) of this Rule provide otherwise.

(b) Design and Operating Requirements [40 CFR 264.221]

1. Any surface impoundment that is not covered by part 3 of this subparagraph or Rule 1200-1-11-.05(11)(b) must have a liner for all portions of the impoundment (except for existing portions of such impoundments). The liner must be designed, constructed, and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any time during the active life (including the closure period) of the impoundment. The liner may be constructed of materials that may allow wastes to migrate into the liner (but not into the adjacent subsurface soil or ground water or surface water) during the active life of the facility, provided that the impoundment is closed in accordance with subpart (i)1(i) of this paragraph. For impoundments that will be closed in accordance with subpart (i)1(ii), the liner must be constructed of materials that can prevent wastes from migrating into the liner during the active life of the facility. The liner must be:

- (i) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;
- (ii) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and
- (iii) Installed to cover all surrounding earth likely to be in contact with the waste or leachate.

2. The owner or operator will be exempted from the requirements of part 1 of this subparagraph if the Commissioner finds, based on a demonstration by the owner or operator, that alternate design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents (see subparagraph (6)(d) of this Rule) into the ground water or surface water at any future time. In deciding whether to grant an exemption, the Commissioner will consider:

- (i) The nature and quantity of the wastes;

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- (ii) The proposed alternate design and operation;
 - (iii) The hydrogeologic setting of the facility, including the attenuative capacity and thickness of the liners and soils present between the impoundment and ground water or surface water; and
 - (iv) All other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to ground water or surface water.
- 3. The owner or operator of each new surface impoundment unit on which construction commences after January 29, 1992, each lateral expansion of a surface impoundment unit on which construction commences after July 29, 1992 and each replacement of an existing surface impoundment unit that is to commence reuse after July 29, 1992 must install two or more liners and a leachate collection and removal system between such liners. "Construction commences" is as defined in Rule 1200-1-11-.01(2)(a) under "existing facility".
 - (i)
 - (I) The liner system must include:
 - I. A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period; and
 - II. A composite bottom liner, consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.
 - (II) The liners must comply with subparts (b)1(i),(ii) and (iii) of this paragraph.
 - (ii) The leachate collection and removal system between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a leak detection system. This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this subpart are satisfied by installation of a system that is, at a minimum:
 - (I) Constructed with a bottom slope of one percent or more;
 - (II) Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-1} cm/sec or more and a thickness of 12 inches

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- (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of $3 \times 10^{-4} \text{ m}^2/\text{sec}$ or more;
- (III) Constructed of materials that are chemically resistant to the waste managed in the surface impoundment and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes and any waste cover materials or equipment used at the surface impoundment;
 - (IV) Designed and operated to minimize clogging during the active life and post-closure care period; and
 - (V) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit must have its own sump(s). The design of each sump and removal system must provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.
- (iii) The owner or operator shall collect and remove pumpable liquids in the sumps to minimize the head on the bottom liner.
 - (iv) The owner or operator of a leak detection system that is not located completely above the seasonal high water table must demonstrate that the operation of the leak detection system will not be adversely affected by the presence of ground water.
4. The Commissioner may approve alternative design or operating practices to those specified in part 3 of this subparagraph if the owner or operator demonstrates to the Commissioner that such design and operating practices, together with location characteristics:
- (i) Will prevent the migration of any hazardous constituent into the ground water or surface water at least as effectively as the liners and leachate collection and removal system specified in part 3 of this subparagraph; and
 - (ii) Will allow detection of leaks of hazardous constituents through the top liner at least as effectively.
5. The double liner requirement set forth in part 3 of this subparagraph may be waived by the Commissioner for any monofill, if:
- (i) The monofill contains only hazardous wastes from foundry furnace emission controls or metal casting molding sand, and such wastes do not contain constituents which would render the wastes hazardous for reasons other than the EP toxicity characteristics in Rule 1200-1-11-.02(3)(e); and
 - (ii) (I) I. The monofill has at least one liner for which there is no evidence that such liner is leaking. For the purposes of this paragraph, the term "liner" means a liner designed, constructed, installed, and operated to prevent hazardous waste from passing into the liner at any time during the active life of the facility, or a liner designed, constructed, installed, and operated to prevent hazardous waste from migrating

beyond the liner to adjacent subsurface soil, ground water, or surface water at any time during the active life of the facility. In the case of any surface impoundment which has been exempted from the requirements of part 3 of this subparagraph on the basis of a liner designed, constructed, installed, and operated to prevent hazardous waste from passing beyond the liner, at the closure of such impoundment, the owner or operator must remove or decontaminate all waste residues, all contaminated liner material, and contaminated soil to the extent practicable. If all contaminated soil is not removed or decontaminated, the owner or operator of such impoundment will comply with appropriate post-closure requirements, including but not limited to ground-water monitoring and corrective action;

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- II. The monofill is located more than one-quarter mile from an underground source of drinking water (as that term is defined in Rule 1200-1-11-.01(2)(a)); and
 - III. The monofill is in compliance with generally applicable ground-water monitoring requirements for facilities with permits under T.C.A. Section 68-212-108 of the Act;
- (II) The owner or operator demonstrates that the monofill is located, designed and operated so as to assure that there will be no migration of any hazardous constituent into ground water or surface water at any future time.
6. The owner or operator of any replacement surface impoundment unit is exempt from part 3 of this subparagraph if:
- (i) The existing unit was constructed in compliance with the design standards of paragraph (11) of this Rule; and
 - (ii) There is no reason to believe that the liner is not functioning as designed.
7. A surface impoundment must be designed, constructed, maintained, and operated to prevent overtopping resulting from normal or abnormal operations; overfilling; wind and wave action; rainfall; run-on; malfunctions of level controllers, alarms, and other equipment; and human error.
8. A surface impoundment must have dikes that are designed, constructed, and maintained with sufficient structural integrity to prevent massive failure of the dikes. In ensuring structural integrity, it must not be presumed that the liner system will function without leakage during the active life of the unit.
9. The Commissioner will specify in the permit all design and operating practices that are necessary to ensure that the requirements of this subparagraph are satisfied.
- (c) Action Leakage Rate [40 CFR 264.222]
1. The Commissioner shall approve an action leakage rate for surface impoundment units subject to part (b)3 or 4 of this paragraph. The action leakage rate is the maximum design flow rate that the leak detection system (LDS) can remove without the fluid head on the

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bottom liner exceeding 1 foot. The action leakage rate must include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation, and location of the LDS, waste and leachate characteristics, likelihood and amounts of other sources of liquids in the LDS, and proposed response actions (e.g., the action leakage rate must consider decreases in the flow capacity of the system over time resulting from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.).

2. To determine if the action leakage rate has been exceeded, the owner or operator must convert the weekly or monthly flow rate from the monitoring data obtained under part (g)4 of this paragraph to an average daily flow rate (gallons per acre per day) for each sump. Unless the Commissioner approves a different calculation, the average daily flow rate for each sump must be calculated weekly during the active life and closure period, and if the unit is closed in accordance with part (i)2 of this paragraph, monthly during the post-closure care period when monthly monitoring is required under part (g)4 of this paragraph.

(d) Response Actions [40 CFR 264.223]

1. The owner or operator of surface impoundment units subject to parts (b)3 or 4 of this paragraph must have an approved response action plan before receipt of waste. The response action plan must set forth the actions to be taken if the action leakage rate has been exceeded. At a minimum, the response action plan must describe the actions specified in part 2 of this subparagraph.
2. If the flow rate into the leak detection system exceeds the action leakage rate for any sump, the owner or operator must:
 - (i) Notify the Commissioner in writing of the exceedence within 7 days of the determination;
 - (ii) Submit a preliminary written assessment to the Commissioner within 14 days of the determination, as to the amount of liquids, likely sources of liquids, possible location, size, and cause of any leaks, and short-term actions taken and planned;
 - (iii) Determine to the extent practicable the location, size, and cause of any leak;
 - (iv) Determine whether waste receipt should cease or be curtailed, whether any waste should be removed from the unit for inspection, repairs, or controls, and whether or not the unit should be closed;
 - (v) Determine any other short-term and longer-term actions to be taken to mitigate or stop any leaks; and
 - (vi) Within 30 days after the notification that the action leakage rate has been exceeded, submit to the Commissioner the results of the analyses specified in subparts (iii), (iv), and (v) of this part, the results of actions taken, and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the owner or operator must submit to the Commissioner a report summarizing the results of any remedial actions taken and actions planned.

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3. To make the leak and/or remediation determinations in subparts 2(iii), (iv), and (v) of this subparagraph, the owner or operator must:
 - (i)
 - (I) Assess the source of liquids and amounts of liquids by source,
 - (II) Conduct a fingerprint, hazardous constituent, or other analyses of the liquids in the leak detection system to identify the source of liquids and possible location of any leaks, and the hazard and mobility of the liquid; and
 - (III) Assess the seriousness of any leaks in terms of potential for escaping into the environment; or
 - (ii) Document why such assessments are not needed.

(e)-(f) (RESERVED) [40 CFR 264.224-264.225]

(g) Monitoring and Inspection [40 CFR 264.226]

1. During construction and installation, liners (except in the case of existing portions of surface impoundments exempt from part (b)1 of this paragraph) and cover systems (e.g., membranes, sheets, or coatings) must be inspected for uniformity, damage, and imperfections (e.g., holes, cracks, thin spots, or foreign materials). Immediately after construction or installation:
 - (i) Synthetic liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters; and
 - (ii) Soil-based and admixed liners and covers must be inspected for imperfections including lenses, cracks, channels, root holes, or other structural non-uniformities that may cause an increase in the permeability of the liner or cover.
2. While a surface impoundment is in operation, it must be inspected weekly and after storms to detect evidence of any of the following:
 - (i) Deterioration, malfunctions, or improper operation of overtopping control systems;
 - (ii) Sudden drops in the level of the impoundment's contents; and
 - (iii) Severe erosion or other signs of deterioration in dikes or other containment devices.
3. Prior to the issuance of a permit, and after any extended period of time (at least six months) during which the impoundment was not in service, the owner or operator must obtain a certification from a qualified engineer that the impoundment's dike, including that portion of any dike which provides freeboard, has structural integrity. The certification must establish, in particular, that the dike:
 - (i) Will withstand the stress of the pressure exerted by the types and amounts of wastes to be placed in the impoundment; and
 - (ii) Will not fail due to scouring or piping, without dependence on any liner system included in the surface impoundment construction.

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4.
 - (i) An owner or operator required to have a leak detection system under parts (b)3 or 4 of this paragraph must record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.
 - (ii) After the final cover is installed, the amount of liquids removed from each leak detection system sump must be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months.
 - (iii) "Pump operating level" is a liquid level proposed by the owner or operator and approved by the Commissioner based on pump activation level, sump dimensions, and level that avoids backup into the drainage layer and minimizes head in the sump.
- (h) Emergency Repairs; Contingency Plans [40 CFR 264.227]
 1. A surface impoundment must be removed from service in accordance with part 2 of this subparagraph when:
 - (i) The level of liquids in the impoundment suddenly drops and the drop is not known to be caused by changes in the flows into or out of the impoundment; or
 - (ii) The dike leaks.
 2. When a surface impoundment must be removed from service as required by part 1 of this subparagraph, the owner or operator must:
 - (i) Immediately shut off the flow or stop the addition of wastes into the impoundment;
 - (ii) Immediately contain any surface leakage which has occurred or is occurring;
 - (iii) Immediately stop the leak;
 - (iv) Take any other necessary steps to stop or prevent catastrophic failure;
 - (v) If a leak cannot be stopped by any other means, empty the impoundment; and
 - (vi) Notify the Commissioner of the problem in writing within seven days after detecting the problem.
 3. As part of the contingency plan required in paragraph 4 of this Rule, the owner or operator must specify a procedure for complying with the requirements of part 2 of this subparagraph.

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4. No surface impoundment that has been removed from service in accordance with the requirements of this section may be restored to service unless the portion of the impoundment which was failing is repaired and the following steps are taken:
 - (i) If the impoundment was removed from service as the result of actual or imminent dike failure, the dike's structural integrity must be recertified in accordance with part (g)3 of this paragraph.
 - (ii) If the impoundment was removed from service as the result of a sudden drop in the liquid level, then:
 - (I) For any existing portion of the impoundment, a liner must be installed in compliance with part (b)1 of this paragraph; and
 - (II) For any other portion of the impoundment, the repaired liner system must be certified by a qualified engineer as meeting the design specifications approved in the permit.
5. A surface impoundment that has been removed from service in accordance with the requirements of this subparagraph and that is not being repaired must be closed in accordance with the provisions of subparagraph (i) of this paragraph.
 - (i) Closure and Post-closure Care [40 CFR 264.228]
 1. At closure, the owner or operator must:
 - (i) Remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless Rule 1200-1-11-.02(1)(c)4 applies; or
 - (ii)
 - (I) Eliminate free liquids by removing liquid wastes or solidifying the remaining wastes and waste residues;
 - (II) Stabilize remaining wastes to a bearing capacity sufficient to support final cover; and
 - (III) Cover the surface impoundment with a final cover designed and constructed to:
 - I. Provide long-term minimization of the migration of liquids through the closed impoundment;
 - II. Function with minimum maintenance;
 - III. Promote drainage and minimize erosion or abrasion of the final cover;
 - IV. Accommodate settling and subsidence so that the cover's integrity is maintained; and
 - V. Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

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2. If some waste residues or contaminated materials are left in place at final closure, the owner or operator must comply with all post-closure requirements contained in subparagraphs (7)(h) - (k) of this Rule, including maintenance and monitoring throughout the post-closure care period (specified in the permit under subparagraph (7)(h) of this Rule). The owner or operator must:
 - (i) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;
 - (ii) Maintain and monitor the leak detection system in accordance with item (b)3(ii)(IV), subpart (b)3(iii), and part (g)4 of this Rule, and comply with all other applicable leak detection system requirements of this Rule;
 - (iii) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of paragraph (6) of this Rule; and
 - (iv) Prevent run-on and run-off from eroding or otherwise damaging the final cover.
3.
 - (i) If an owner or operator plans to close a surface impoundment in accordance with subpart 1(i) of this subparagraph, and the impoundment does not comply with the liner requirements of part (b)1 of this paragraph and is not exempt from them in accordance with part (b)2 of this paragraph, then:
 - (I) The closure plan for the impoundment under subparagraph (7)(c) of this Rule must include both a plan for complying with subpart 1(i) of this subparagraph and a contingent plan for complying with subpart 1(ii) of this subparagraph in case not all contaminated subsoils can be practicably removed at closure; and
 - (II) The owner or operator must prepare a contingent post-closure plan under subparagraph (7)(i) of this Rule for complying with part 2 of this subparagraph in case not all contaminated subsoils can be practicably removed at closure.
 - (ii) The cost estimates calculated under subparagraphs (8)(c) and (8)(e) of this Rule for closure and post-closure care of an impoundment subject to this paragraph must include the cost of complying with the contingent closure plan and the contingent post-closure plan, but are not required to include the cost of expected closure under subpart 1(i) of this subparagraph.

(j) Special Requirements for Ignitable or Reactive Waste [40 CFR 264.229]

Ignitable or reactive waste must not be placed in a surface impoundment, unless the waste and impoundment satisfy all applicable requirements of Rule 1200-1-11-.10, and:

1. The waste is treated, rendered, or mixed before or immediately after placement in the impoundment so that:
 - (i) The resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under Rules 1200-1-11-.02(3)(b) or (d); and
 - (ii) Part (2)(h)2 of this Rule is complied with; or

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2. The waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react; or
 3. The surface impoundment is used solely for emergencies.
- (k) Special Requirements for Incompatible Wastes [40 CFR 264.230]
- Incompatible wastes, or incompatible wastes and materials, (see Appendix V in paragraph (57) of this Rule for examples) must not be placed in the same surface impoundment, unless part (2)(h)2 of this Rule is complied with.
- (l) Special Requirements for Hazardous Wastes F020, F021, F022, F023, F026, and F027 [40 CFR 264.231]
1. Hazardous Wastes F020, F021, F022, F023, F026, and F027 must not be placed in a surface impoundment unless the owner or operator operates the surface impoundment in accordance with a management plan for these wastes that is approved by the Commissioner pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this Rule. The factors to be considered are:
 - (i) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;
 - (ii) The attenuative properties of underlying and surrounding soils or other materials;
 - (iii) The mobilizing properties of other materials co-disposed with these wastes; and
 - (iv) The effectiveness of additional treatment, design, or monitoring techniques.
 2. The Commissioner may determine that additional design, operating, and monitoring requirements are necessary for surface impoundments managing hazardous wastes F020, F021, F022, F023, F026, and F027 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.
- (m) Air Emission Standards [40 CFR 264.232]
- The owner or operator shall manage all hazardous waste placed in a surface impoundment in accordance with the applicable requirements of paragraphs (31) and (32) of this Rule
- (12) Waste Piles [40 CFR 264 Subpart L]
- (a) Applicability [40 CFR 264.250]
1. The regulations in this paragraph apply to owners and operators of facilities that store or treat hazardous waste in piles, except as subparagraph (1)(b) and (1)(d) of this Rule provide otherwise.
 2. The regulations in this paragraph do not apply to owners or operators of waste piles that are closed with wastes left in place. Such waste piles are subject to regulation under paragraph (14) of this Rule (Landfills).

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3. The owner or operator of any waste pile that is inside or under a structure that provides protection from precipitation so that neither run-off nor leachate is generated is not subject to regulation under subparagraph (b) of this paragraph or under paragraph (6) of this Rule, provided that:

- (i) Liquids or materials containing free liquids are not placed in the pile;
- (ii) The pile is protected from surface water run-on by the structure or in some other manner;
- (iii) The pile is designed and operated to control dispersal of the waste by wind, where necessary, by means other than wetting; and
- (iv) The pile will not generate leachate through decomposition or other reactions.

(b) Design and Operating Requirements [40 CFR 264.251]

1. A waste pile (except for an existing portion of a waste pile) must have:

- (i) A liner that is designed, constructed, and installed to prevent any migration of wastes out of the pile into the adjacent subsurface soil or ground water or surface water at any time during the active life (including the closure period) of the waste pile. The liner may be constructed of materials that may allow waste to migrate into the liner itself (but not into the adjacent subsurface soil or ground water or surface water) during the active life of the facility. The liner must be:
 - (I) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;
 - (II) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and
 - (III) Installed to cover all surrounding earth likely to be in contact with the waste or leachate; and
- (ii) A leachate collection and removal system immediately above the liner that is designed, constructed, maintained, and operated to collect and remove leachate from the pile. The Commissioner will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 cm (one foot). The leachate collection and removal system must be:
 - (I) Constructed of materials that are:
 - I. Chemically resistant to the waste managed in the pile and the leachate expected to be generated; and

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- II. Of sufficient strength and thickness to prevent collapse under the pressures exerted by overlaying wastes, waste cover materials, and by any equipment used at the pile; and
 - (II) Designed and operated to function without clogging through the scheduled closure of the waste pile.
- 2. The owner or operator will be exempted from the requirements of part 1 of this subparagraph, if the Commissioner finds, based on a demonstration by the owner or operator, that alternate design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents (see subparagraph (6)(d) of this Rule) into the ground water or surface water at any future time. In deciding whether to grant an exemption, the Commissioner will consider:
 - (i) The nature and quantity of the wastes;
 - (ii) The proposed alternate design and operation;
 - (iii) The hydrogeologic setting of the facility, including attenuative capacity and thickness of the liners and soils present between the pile and ground water or surface water; and
 - (iv) All other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to ground water or surface water.
- 3. The owner or operator of each new waste pile unit on which construction commences after January 29, 1992, each lateral expansion of a waste pile unit on which construction commences after July 29, 1992, and each replacement of an existing waste pile unit that is to commence reuse after July 29, 1992 must install two or more liners and a leachate collection and removal system above and between such liners. "Construction commences" is as defined in Rule 1200-1-11-.01(2)(a) under "existing facility".
 - (i) (I) The liner system must include:
 - I. A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period; and
 - II. A composite bottom liner, consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.
 - (II) The liners must comply with items 1(i)(I),(II), and (III) of this subparagraph.

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- (ii) The leachate collection and removal system immediately above the top liner must be designed, constructed, operated, and maintained to collect and remove leachate from the waste pile during the active life and post-closure care period. The Commissioner will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 cm (one foot). The leachate collection and removal system must comply with items 3(iii)(III) and (IV) of this subparagraph.
 - (iii) The leachate collection and removal system between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a leak detection system. This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:
 - (I) Constructed with a bottom slope of one percent or more;
 - (II) Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-2} cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10^{-5} m²/sec or more;
 - (III) Constructed of materials that are chemically resistant to the waste managed in the waste pile and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the waste pile;
 - (IV) Designed and operated to minimize clogging during the active life and post-closure care period; and
 - (V) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit must have its own sump(s). The design of each sump and removal system must provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.
 - (iv) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.
 - (v) The owner or operator of a leak detection system that is not located completely above the seasonal high water table must demonstrate that the operation of the leak detection system will not be adversely affected by the presence of ground water.
4. The Commissioner may approve alternative design or operating practices to those specified in part 3 of this subparagraph if the owner or operator demonstrates to the Commissioner that such design and operating practices, together with location characteristics:

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- (i) Will prevent the migration of any hazardous constituent into the ground water or surface water at least as effectively as the liners and leachate collection and removal systems specified in part 3 of this subparagraph; and
 - (ii) Will allow detection of leaks of hazardous constituents through the top liner at least as effectively.
 - 5. Part 3 of this subparagraph does not apply to monofills that are granted a waiver by the Commissioner in accordance with part (11)(b)5 of this Rule.
 - 6. The owner or operator of any replacement waste pile unit is exempt from part 3 of this subparagraph if:
 - (i) The existing unit was constructed in compliance with the design standards of paragraph (11) of this Rule; and
 - (ii) There is no reason to believe that the liner is not functioning as designed.
 - 7. The owner or operator must design, construct, operate, and maintain a run-on control system capable of preventing flow onto the active portion of the pile during peak discharge from at least a 25-year storm.
 - 8. The owner or operator must design, construct, operate, and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 25-year storm.
 - 9. Collection and holding facilities (e.g., tanks or basins) associated with run-on and run-off control systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.
 - 10. If the pile contains any particulate matter which may be subject to wind dispersal, the owner or operator must cover or otherwise manage the pile to control wind dispersal.
 - 11. The Commissioner will specify in the permit all design and operating practices that are necessary to ensure that the requirements of this subparagraph are satisfied.
- (c) Action Leakage Rate [40 CFR 264.252]
- 1. The Commissioner shall approve an action leakage rate for surface impoundment units subject to parts (b)3 or 4 of this paragraph. The action leakage rate is the maximum design flow rate that the leak detection system (LDS) can remove without the fluid head on the bottom liner exceeding 1 foot. The action leakage rate must include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation, and location of the LDS, waste and leachate characteristics, likelihood and amounts of other sources of liquids in the LDS, and proposed response actions (e.g., the action leakage rate must consider decreases in the flow capacity of the system over time resulting from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.).
 - 2. To determine if the action leakage rate has been exceeded, the owner or operator must convert the weekly flow rate from the monitoring data obtained under part (e)3 of this paragraph to an average daily flow rate (gallons per acre per day) for each sump. Unless

the Commissioner approves a different calculation, the average daily flow rate for each sump must be calculated weekly during the active life and closure period.

(d) Response Actions [40 CFR 264.253]

1. The owner or operator of waste pile units subject to parts (b)3 or 4 of this paragraph must have an approved response action plan before receipt of waste. The response action plan must set forth the actions to be taken if the action leakage rate has been exceeded. At a minimum, the response action plan must describe the actions specified in part 2 of this subparagraph.
2. If the flow rate into the leak detection system exceeds the action leakage rate for any sump, the owner or operator must:
 - (i) Notify the Commissioner in writing of the exceedance within 7 days of the determination;
 - (ii) Submit a preliminary written assessment to the Commissioner within 14 days of the determination, as to the amount of liquids, likely sources of liquids, possible location, size, and cause of any leaks, and short-term actions taken and planned;
 - (iii) Determine to the extent practicable the location, size, and cause of any leak;
 - (iv) Determine whether waste receipt should cease or be curtailed, whether any waste should be removed from the unit for inspection, repairs, or controls, and whether or not the unit should be closed;
 - (v) Determine any other short-term and long-term actions to be taken to mitigate or stop any leaks; and
 - (vi) Within 30 days after the notification that the action leakage rate has been exceeded, submit to the Commissioner the results of the analyses specified in subparts (iii), (iv) and (v) of this part, the results of actions taken, and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the owner or operator must submit to the Commissioner a report summarizing the results of any remedial actions taken and actions planned.
3. To make the leak and/or remediation determinations in subparts 2(iii), (iv) and (v) of this subparagraph, the owner or operator must:
 - (i)
 - (I) Assess the source of liquids and amounts of liquids by source,
 - (II) Conduct a fingerprint, hazardous constituent, or other analyses of the liquids in the leak detection system to identify the source of liquids and possible location of any leaks, and the hazard and mobility of the liquid; and
 - (III) Assess the seriousness of any leaks in terms of potential for escaping into the environment; or
 - (ii) Document why such assessments are not needed.

(e) Monitoring and Inspection [40 CFR 264.254]

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1. During construction or installation, liners (except in the case of existing portions of piles exempt from part (b)1 of this paragraph) and cover systems (e.g., membranes, sheets, or coatings) must be inspected for uniformity, damage, and imperfections (e.g., holes, cracks, thin spots, or foreign materials). Immediately after construction or installation:
 - (i) Synthetic liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters; and
 - (ii) Soil-based and admixed liners and covers must be inspected for imperfections including lenses, cracks, channels, root holes, or other structural non-uniformities that may cause an increase in the permeability of the liner or cover.
 2. While a waste pile is in operation, it must be inspected weekly and after storms to detect evidence of any of the following:
 - (i) Deterioration, malfunctions, or improper operation of run-on and run-off control systems;
 - (ii) Proper functioning of wind dispersal control systems, where present; and
 - (iii) The presence of leachate in and proper functioning of leachate collection and removal systems, where present.
 3. An owner or operator required to have a leak detection system under part (b)3 of this paragraph must record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.
- (f) (RESERVED) [40 CFR 264.255]
- (g) Special Requirements for Ignitable or Reactive Waste [40 CFR 264.256]
- Ignitable or reactive waste must not be place in a waste pile unless the waste and waste pile satisfy all applicable requirements of Rule 1200-1-11-.10, and:
1. The waste is treated, rendered, or mixed before or immediately after placement in the pile so that:
 - (i) The resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under Rule 1200-1-11-.02(3)(b) or (d); and
 - (ii) Part (2)(h)2 of this Rule is complied with; or
 2. The waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react.
- (h) Special Requirements for Incompatible Wastes [40 CFR 264.257]
1. Incompatible wastes, or incompatible wastes and materials, (see Appendix V in paragraph (57) of this Rule for examples) must not be placed in the same pile, unless part (2)(h)2 of this Rule is complied with.

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2. A pile of hazardous waste that is incompatible with any waste or other material stored nearby in containers, other piles, open tanks, or surface impoundments must be separated from the other materials, or protected from them by means of a dike, berm, wall, or other device.
 3. Hazardous waste must not be piled on the same base where incompatible wastes or materials were previously piled, unless the base has been decontaminated sufficiently to ensure compliance with part (2)(h)2 of this Rule.
- (i) Closure and Post-closure Care [40 CFR 264.258]
1. At closure, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless Rule 1200-1-11-.02(1)(c)4 applies.
 2. If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, subsoils, structures, and equipment as required in part 1 of this subparagraph, the owner or operator finds that not all contaminated subsoils can be practicably removed or decontaminated, he must close the facility and perform post-closure care in accordance with the closure and post-closure care requirements that apply to landfills (subparagraph (14)(k) of this Rule).
 3. (i) The owner or operator of a waste pile that does not comply with the liner requirements of subpart (b)1(i) of this paragraph and is not exempt from them in accordance with parts (a)3 or (b)2 of this paragraph, must:
 - (I) Include in the closure plan for the pile under subparagraph (7)(c) of this Rule both a plan for complying with part 1 of this subparagraph and a contingent plan for complying with part 2 of this subparagraph in case not all contaminated subsoils can be practicably removed at closure; and
 - (II) Prepare a contingent post-closure plan under subparagraph (7)(i) of this Rule for complying with part 2 of this subparagraph not all contaminated subsoils can be practicably removed at closure.
 - (ii) The cost estimates calculated under subparagraphs (8)(c) and (e) of this Rule for closure and post-closure care of a pile subject to this part must include the cost of complying with the contingent closure plan and the contingent post-closure plan, but are not required to include the cost of expected closure under part 1 of this paragraph.
- (j) Special Requirements for Hazardous Wastes F020, F021, F022, F023, F026, and F027 [40 CFR 264.259]
1. Hazardous Wastes F020, F021, F022, F023, F026, and F027 must not be placed in waste piles that are not enclosed (as defined in subparagraph (a)3 of this paragraph) unless the owner or operator operates the waste pile in accordance with a management plan for these wastes that is approved by the Commissioner pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this Rule. The factors to be considered are:

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- (i) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;
 - (ii) The attenuative properties of underlying and surrounding soils or other materials;
 - (iii) The mobilizing properties of other materials co-disposed with these wastes; and
 - (iv) The effectiveness of additional treatment, design, or monitoring techniques.
2. The Commissioner may determine that additional design, operating, and monitoring requirements are necessary for piles managing hazardous wastes F020, F021, F022, F023, F026, and, F027 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

(13) Land Treatment [40 CFR 264 Subpart M]

(a) Applicability [40 CFR 264.270]

The regulations in this subpart apply to owners and operators of facilities that treat or dispose of hazardous waste in land treatment units, except as subparagraphs (1)(b) and (1)(d) of this Rule provide otherwise.

(b) Treatment Program [40 CFR 264.271]

1. An owner or operator subject to this paragraph must establish a land treatment program that is designed to ensure that hazardous constituents placed in or on the treatment zone are degraded, transformed, or immobilized within the treatment zone. The Commissioner will specify in the facility permit the elements of the treatment program, including:
- (i) The wastes that are capable of being treated at the unit based on a demonstration under subparagraph (c) of this paragraph;
 - (ii) Design measures and operating practices necessary to maximize the success of degradation, transformation, and immobilization processes in the treatment zone in accordance with part (d)1 of this paragraph; and
 - (iii) Unsaturated zone monitoring provisions meeting the requirements of subparagraph (i) of this paragraph.
2. The Commissioner will specify in the facility permit the hazardous constituents that must be degraded, transformed, or immobilized under this subpart. Hazardous constituents are constituents identified in Appendix VIII in paragraph (5) of Rule 1200-1-11-.02 that are reasonably expected to be in, or derived from, waste placed in or on the treatment zone.
3. The Commissioner will specify the vertical and horizontal dimensions of the treatment zone in the facility permit. The treatment zone is the portion of the unsaturated zone below and including the land surface in which the owner or operator intends to maintain the conditions necessary for effective degradation, transformation, or immobilization of hazardous constituents. The maximum depth of the treatment zone must be:
- (i) No more than 1.5 meters (5 feet) from the initial soil surface; and
 - (ii) More than 1 meter (3 feet) above the seasonal high water table.

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(c) Treatment Demonstration [40 CFR 264.272]

1. For each waste that will be applied to the treatment zone, the owner or operator must demonstrate, prior to application of the waste, that hazardous constituents in the waste can be completely degraded, transformed, or immobilized in the treatment zone.
2. In making this demonstration, the owner or operator may use field tests, laboratory analyses, available data, or, in the case of existing units, operating data. If the owner or operator intends to conduct field tests or laboratory analyses in order to make the demonstration required under part 1 of this subparagraph, he must obtain a treatment or disposal permit under Rule 1200-1-11-.07(1)(f). The Commissioner will specify in this permit the testing, analytical, design, and operating requirements (including the duration of the tests and analyses, and, in the case of field tests, the horizontal and vertical dimensions of the treatment zone, monitoring procedures, closure and clean-up activities) necessary to meet the requirements in part 3 of this subparagraph.
3. Any field test or laboratory analysis conducted in order to make a demonstration under part 1 of this subparagraph must:
 - (i) Accurately simulate the characteristics and operating conditions for the proposed land treatment unit including:
 - (I) The characteristics of the waste (including the presence of Appendix VIII in paragraph (5) of Rule 1200-1-11-.02);
 - (II) The climate in the area;
 - (III) The topography of the surrounding area;
 - (IV) The characteristics of the soil in the treatment zone (including depth); and
 - (V) The operating practices to be used at the unit.
 - (ii) Be likely to show that hazardous constituents in the waste to be tested will be completely degraded, transformed, or immobilized in the treatment zone of the proposed land treatment unit; and
 - (iii) Be conducted in a manner that protects human health and the environment considering:
 - (I) The characteristics of the waste to be tested;
 - (II) The operating and monitoring measures taken during the course of the test;
 - (III) The duration of the test;
 - (IV) The volume of waste used in the test;
 - (V) In the case of field tests, the potential for migration of hazardous constituents to ground water or surface water.

(d) Design and Operating Requirements [40 CFR 264.273]

The Commissioner will specify in the facility permit how the owner or operator will design, construct, operate, and maintain the land treatment unit in compliance with this subparagraph.

1. The owner or operator must design, construct, operate, and maintain the unit to maximize the degradation, transformation, and immobilization of hazardous constituents in the treatment zone. The owner or operator must design, construct, operate, and maintain the unit in accord with all design and operating conditions that were used in the treatment demonstration under subparagraph (c) of this paragraph. At a minimum, the Commissioner will specify the following in the facility permit:
 - (i) The rate and method of waste application to the treatment zone;
 - (ii) Measures to control soil pH;
 - (iii) Measures to enhance microbial or chemical reactions (e.g., fertilization, tilling); and
 - (iv) Measures to control the moisture content of the treatment zone.
2. The owner or operator must design, construct, operate, and maintain the treatment zone to minimize run-off of hazardous constituents during the active life of the land treatment unit.
3. The owner or operator must design, construct, operate, and maintain a run-on control system capable of preventing flow onto the treatment zone during peak discharge from at least a 25-year storm.
4. The owner or operator must design, construct, operate, and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 25-year storm.
5. Collection and holding facilities (e.g., tanks or basins) associated with run-on and run-off control systems must be emptied or otherwise managed expeditiously after storms to maintain the design capacity of the system.
6. If the treatment zone contains particulate matter which may be subject to wind dispersal, the owner or operator must manage the unit to control wind dispersal.
7. The owner or operator must inspect the unit weekly and after storms to detect evidence of:
 - (i) Deterioration, malfunctions, or improper operation of run-on and run-off control systems; and
 - (ii) Improper functioning of wind dispersal control measures.

(e)-(f) (RESERVED) [40 CFR 264.274-264.275]

(g) Food-chain Crops [40 CFR 264.276]

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The Commissioner may allow the growth of food-chain crops in or on the treatment zone only if the owner or operator satisfies the conditions of this subparagraph. The Commissioner will specify in the facility permit the specific food-chain crops which may be grown.

1. (i) The owner or operator must demonstrate that there is no substantial risk to human health caused by the growth of such crops in or on the treatment zone by demonstrating, prior to the planting of such crops, that hazardous constituents other than cadmium:
 - (I) Will not be transferred to the food or feed portions of the crop by plant uptake or direct contact, and will not otherwise be ingested by food-chain animals (e.g., by grazing); or
 - (II) Will not occur in greater concentrations in or on the food or feed portions of crops grown on the treatment zone than in or on identical portions of the same crops grown on untreated soils under similar conditions in the same region.
 - (ii) The owner or operator must make the demonstration required under this paragraph prior to the planting of crops at the facility for all constituents identified in Appendix VIII of Rule 1200-1-11-.02(5) that are reasonably expected to be in, or derived from, waste placed in or on the treatment zone.
 - (iii) In making a demonstration under this part, the owner or operator may use field tests, greenhouse studies, available data, or, in the case of existing units, operating data, and must:
 - (I) Base the demonstration on conditions similar to those present in the treatment zone, including soil characteristics (e.g., pH, cation exchange capacity), specific wastes, application rates, application methods, and crops to be grown; and
 - (II) Describe the procedures used in conducting any tests, including the sample selection criteria, sample size, analytical methods, and statistical procedures.
 - (iv) If the owner or operator intends to conduct field tests or greenhouse studies in order to make the demonstration required under this part, he must obtain a permit for conducting such activities.
2. The owner or operator must comply with the following conditions if cadmium is contained in wastes applied to the treatment zone:
 - (i) (I) The pH of the waste and soil mixture must be 6.5 or greater at the time of each waste application, except for waste containing cadmium at concentrations of 2 mg/kg (dry weight) or less;
 - (II) The annual application of cadmium from waste must not exceed 0.5 kilograms per hectare (kg/ha) on land used for production of tobacco, leafy vegetables, or root crops grown for human consumption. For other food-chain crops, the annual cadmium application rate must not exceed:

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Time period	Annual Cd application rate (kilograms per hectare)
Present to June 30, 1984	2.0
July 1, 1984 to December 31, 1986	1.25
Beginning January 1, 1987	0.5

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- (III) The cumulative application of cadmium from waste must not exceed 5 kg/ha if the waste and soil mixture has a pH of less than 6.5; and
 - (IV) If the waste and soil mixture has a pH of 6.5 or greater or is maintained at a pH of 6.5 or greater during crop growth, the cumulative application of cadmium from waste must not exceed: 5 kg/ha if soil cation exchange capacity (CEC) is less than 5 meq/100g; 10 kg/ha if soil CEC is 5-15 meq/100g; and 20 kg/ha if soil CEC is greater than 15 meq/100g; or
 - (ii) (I) Animal feed must be the only food-chain crop produced;
 - (II) The pH of the waste and soil mixture must be 6.5 or greater at the time of waste application or at the time the crop is planted, whichever occurs later, and this pH level must be maintained whenever food-chain crops are grown;
 - (III) There must be an operating plan which demonstrates how the animal feed will be distributed to preclude ingestion by humans. The operating plan must describe the measures to be taken to safeguard against possible health hazards from cadmium entering the food chain, which may result from alternative land uses; and
 - (IV) Future property owners must be notified by a stipulation in the land record or property deed which states that the property has received waste at high cadmium application rates and that food-chain crops must not be grown except in compliance with subpart 2(ii) of this subparagraph.
 - (h) (RESERVED) [40 CFR 264.277]
 - (i) Unsaturated Zone Monitoring [40 CFR 264.278]
- An owner or operator subject to this paragraph must establish an unsaturated zone monitoring program to discharge the following responsibilities:
1. The owner or operator must monitor the soil and soil-pore liquid to determine whether hazardous constituents migrate out of the treatment zone.
 - (i) The Commissioner will specify the hazardous constituents to be monitored in the facility permit. The hazardous constituents to be monitored are those specified under part (b)2 of this paragraph.

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- (ii) The Commissioner may require monitoring for principal hazardous constituents (PHCs) in lieu of the constituents specified under part (b)2 of this paragraph. PHCs are hazardous constituents contained in the wastes to be applied at the unit that are the most difficult to treat, considering the combined effects of degradation, transformation, and immobilization. The Commissioner will establish PHCs if he finds, based on waste analyses, treatment demonstrations, or other data, that effective degradation, transformation, or immobilization of the PHCs will assure treatment at least equivalent levels for the other hazardous constituents in the wastes.
- 2. The owner or operator must install an unsaturated zone monitoring system that includes soil monitoring using soil cores and soil-pore liquid monitoring using devices such as lysimeters. The unsaturated zone monitoring system must consist of a sufficient number of sampling points at appropriate locations and depths to yield samples that:
 - (i) Represent the quality of background soil-pore liquid quality and the chemical make-up of soil that has not been affected by leakage from the treatment zone; and
 - (ii) Indicate the quality of soil-pore liquid and the chemical make-up of the soil below the treatment zone.
- 3. The owner or operator must establish a background value for each hazardous constituent to be monitored under part 1 of this subparagraph. The permit will specify the background values for each constituent or specify the procedures to be used to calculate the background values.
 - (i) Background soil values may be based on a one-time sampling at a background plot having characteristics similar to those of the treatment zone.
 - (ii) Background soil-pore liquid values must be based on at least quarterly sampling for one year at a background plot having characteristics similar to those of the treatment zone.
 - (iii) The owner or operator must express all background values in a form necessary for the determination of statistically significant increases under part 6 of this subparagraph.
 - (iv) In taking samples used in the determination of all background values, the owner or operator must use an unsaturated zone monitoring system that complies with subpart 2(i) of this subparagraph.
- 4. The owner or operator must conduct soil monitoring and soil-pore liquid monitoring immediately below the treatment zone. The Commissioner will specify the frequency and timing of soil and soil-pore liquid monitoring in the facility permit after considering the frequency, timing, and rate of waste application, and the soil permeability. The owner or operator must express the results of soil and soil-pore liquid monitoring in a form necessary for the determination of statistically significant increases under part 6 of this subparagraph.
- 5. The owner or operator must use consistent sampling and analysis procedures that are designed to ensure sampling results that provide a reliable indication of soil-pore liquid quality and the chemical make-up of the soil below the treatment zone. At a minimum, the owner or operator must implement procedures and techniques for:

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- (i) Sample collection;
 - (ii) Sample preservation and shipment;
 - (iii) Analytical procedures; and
 - (iv) Chain of custody control.
6. The owner or operator must determine whether there is a statistically significant change over background values for any hazardous constituent to be monitored under part 1 of this subparagraph below the treatment zone each time he conducts soil monitoring and soil-pore liquid monitoring under part 4 of this subparagraph.
- (i) In determining whether a statistically significant increase has occurred, the owner or operator must compare the value of each constituent, as determined under part 4 of this subparagraph, to the background value for that constituent according to the statistical procedure specified in the facility permit under this part.
 - (ii) The owner or operator must determine whether there has been a statistically significant increase below the treatment zone within a reasonable time period after completion of sampling. The Commissioner will specify that time period in the facility permit after considering the complexity of the statistical test and the availability of laboratory facilities to perform the analysis of soil and soil-pore liquid samples.
 - (iii) The owner or operator must determine whether there is a statistically significant increase below the treatment zone using a statistical procedure that provides reasonable confidence that migration from the treatment zone will be identified. The Commissioner will specify a statistical procedure in the facility permit that he finds:
 - (I) Is appropriate for the distribution of the data used to establish background values; and
 - (II) Provides a reasonable balance between the probability of falsely identifying migration from the treatment zone and the probability of failing to identify real migration from the treatment zone.
7. If the owner or operator determines, pursuant to part 6 of this subparagraph, that there is a statistically significant increase of hazardous constituents below the treatment zone, he must:
- (i) Notify the Commissioner of this finding in writing within seven days. The notification must indicate what constituents have shown statistically significant increases.
 - (ii) Within 90 days, submit to the Commissioner an application for a permit modification to modify the operating practices at the facility in order to maximize the success of degradation, transformation, or immobilization processes in the treatment zone.

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8. If the owner or operator determines, pursuant to part 6 of this subparagraph, that there is a statistically significant increase of hazardous constituents below the treatment zone, he may demonstrate that a source other than regulated units caused the increase or that the increase resulted from an error in sampling, analysis, or evaluation. While the owner or operator may make a demonstration under this part in addition to, or in lieu of, submitting a permit modification application under subpart 7(ii) of this subparagraph, he is not relieved of the requirement to submit a permit modification application within the time specified in subpart 7(ii) of this subparagraph unless the demonstration made under this part successfully shows that a source other than regulated units caused the increase or that the increase resulted from an error in sampling, analysis, or evaluation. In making a demonstration under this part, the owner or operator must:

- (i) Notify the Commissioner in writing within seven days of determining a statistically significant increase below the treatment zone that he intends to make a determination under this part;
- (ii) Within 90 days, submit a report to the Commissioner demonstrating that a source other than the regulated units caused the increase or that the increase resulted from error in sampling, analysis, or evaluation;
- (iii) Within 90 days, submit to the Commissioner an application for a permit modification to make any appropriate changes to the unsaturated zone monitoring program at the facility; and
- (iv) Continue to monitor in accordance with the unsaturated zone monitoring program established under this section.

- (j) Recordkeeping [40 CFR 264.279]

The owner or operator must include hazardous waste application dates and rates in the operating record required under subparagraph (5)(d) of this Rule

- (k) Closure and Post-closure Care [40 CFR 264.280]

1. During the closure period the owner or operator must:

- (i) Continue all operations (including pH control) necessary to maximize degradation, transformation, or immobilization of hazardous constituents within the treatment zone as required under part (d)1 of this paragraph, except to the extent such measures are inconsistent with subpart (viii) of this part;
- (ii) Continue all operations in the treatment zone to minimize run-off of hazardous constituents as required under part (d)2 of this paragraph;
- (iii) Maintain the run-on control system required under part (d)3 of this paragraph;
- (iv) Maintain the run-off management system required under part (d)4 of this paragraph;
- (v) Control wind dispersal of hazardous waste if required under part (d)6 of this paragraph;
- (vi) Continue to comply with any prohibitions or conditions concerning growth of food-chain crops under subparagraph (g) of this paragraph;

- (vii) Continue unsaturated zone monitoring in compliance with subparagraph (i) of this paragraph, except that soil-pore liquid monitoring may be terminated 90 days after the last application of waste to the treatment zone; and
 - (viii) Establish a vegetative cover on the portion of the facility being closed at such time that the cover will not substantially impede degradation, transformation, or immobilization of hazardous constituents in the treatment zone. The vegetative cover must be capable of maintaining growth without extensive maintenance.
2. For the purpose of complying with subparagraph (7)(f) of this Rule, when closure is completed the owner or operator may submit to the Commissioner certification by an independent qualified soil scientist, in lieu of an independent registered professional engineer, that the facility has been closed in accordance with the specifications in the approved closure plan.
3. During the post-closure care period the owner or operator must:
- (i) Continue all operations (including pH control) necessary to enhance degradation and transformation and sustain immobilization of hazardous constituents in the treatment zone to the extent that such measures are consistent with other post-closure care activities;
 - (ii) Maintain a vegetative cover over closed portions of the facility;
 - (iii) Maintain the run-on control system required under part (d)3 of this paragraph;
 - (iv) Maintain the run-off management system required under part (d)4 of this paragraph;
 - (v) Control wind dispersal of hazardous waste if required under part (d)6 of this paragraph;
 - (vi) Continue to comply with any prohibitions or conditions concerning growth of food-chain crops under subparagraph (g) of this paragraph; and
 - (vii) Continue unsaturated zone monitoring in compliance with subparagraph (i) of this paragraph, except that soil-pore liquid monitoring may be terminated 90 days after the last application of waste to the treatment zone.
4. The owner or operator is not subject to regulation under subpart 1(viii) and part 3 of this subparagraph, if the Commissioner finds that the level of hazardous constituents in the treatment zone soil does not exceed the background value of those constituents by an amount that is statistically significant when using the test specified in subpart (iii) of this part. The owner or operator may submit such a demonstration to the Commissioner at any time during the closure of post-closure care periods. For the purposes of this part:
- (i) The owner or operator must establish background soil values and determine whether there is a statistically significant increase over those values for all hazardous constituents specified in the facility permit under part (b)2 of this paragraph.

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- (I) Background soil values may be based on a one-time sampling of a background plot having characteristics similar to those of the treatment zone.
 - (II) The owner or operator must express background values and values for hazardous constituents in the treatment zone in a form necessary for the determination of statistically significant increases under subpart (iii) of this part.
 - (ii) In taking samples used in the determination of background and treatment zone values, the owner or operator must take samples at a sufficient number of sampling points and at appropriate locations and depths to yield samples that represent the chemical make-up of soil that has not been affected by leakage from the treatment zone and the soil within the treatment zone, respectively.
 - (iii) In determining whether a statistically significant increase has occurred, the owner or operator must compare the value of each constituent in the treatment zone to the background value for that constituent using a statistical procedure that provides reasonable confidence that constituent presence in the treatment zone will be identified. The owner or operator must use a statistical procedure that:
 - (I) Is appropriate for the distribution of the data used to establish background values; and
 - (II) Provides a reasonable balance between the probability of falsely identifying hazardous constituent presence in the treatment zone and the probability of failing to identify real presence in the treatment zone.
5. The owner or operator is not subject to regulation under paragraph (6) of this Rule if the Commissioner finds that the owner or operator satisfies part 4 of this subparagraph and if unsaturated zone monitoring under subparagraph (i) of this paragraph indicates that hazardous constituents have not migrated beyond the treatment zone during the active life of the land treatment unit.
- (l) Special Requirements for Ignitable or Reactive Waste [40 CFR 264.281]
- The owner or operator must not apply ignitable or reactive waste to the treatment zone unless the waste and the treatment zone meet all applicable requirements of Rule 1200-1-11-.10, and:
- 1. The waste is immediately incorporated into the soil so that:
 - (i) The resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under Rule 1200-1-11-.02(3)(b) or (d); and
 - (ii) Part (2)(h)2 of this Rule is complied with; or
 - 2. The waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react.
- (m) Special Requirements for Incompatible Wastes [40 CFR 264.282]

The owner or operator must not place incompatible wastes, or incompatible wastes and materials (see Appendix V in paragraph (57) of this Rule for examples), in or on the same treatment zone, unless part (2)(h)2 of this Rule is complied with.

(n) Special Requirements for Hazardous Wastes F020, F021, F022, F023, F026, and F027 [40 CFR 264.283]

1. Hazardous Wastes F020, F021, F022, F023, F026 and, F027 must not be placed in a land treatment unit unless the owner or operator operates the facility in accordance with a management plan for these wastes that is approved by the Commissioner pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this part. The factors to be considered are:

- (i) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;
- (ii) The attenuative properties of underlying and surrounding soils or other materials;
- (iii) The mobilizing properties of other materials co-disposed with these wastes; and
- (iv) The effectiveness of additional treatment, design, or monitoring techniques.

2. The Commissioner may determine that additional design, operating, and monitoring requirements are necessary for land treatment facilities managing hazardous wastes F020, F021, F022, F023, F026, and F027 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

(14) Landfills [40 CFR 264 Subpart N]

(a) Applicability [40 CFR 264.300]

The regulations in this paragraph apply to owners and operators of facilities that dispose of hazardous waste in landfills, except as subparagraphs (1)(b) and (1)(d) of this Rule provide otherwise.

(b) Design and Operating Requirements [40 CFR 264.301]

1. Any landfill that is not covered by part 3 of this subparagraph or Rule 1200-1-11-.05(14)(b)1 must have a liner system for all portions of the landfill (except for existing portions of such landfill). The liner system must have:

- (i) A liner that is designed, constructed, and installed to prevent any migration of wastes out of the landfill to the adjacent subsurface soil or ground water or surface water at anytime during the active life (including the closure period) of the landfill. The liner must be constructed of materials that prevent wastes from passing into the liner during the active life of the facility. The liner must be:
 - (I) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed,

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- climatic conditions, the stress of installation, and the stress of daily operation;
- (II) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and
 - (III) Installed to cover all surrounding earth likely to be in contact with the waste or leachate; and
- (ii) A leachate collection and removal system immediately above the liner that is designed, constructed, maintained, and operated to collect and remove leachate from the landfill. The Commissioner will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 cm (one foot). The leachate collection and removal system must be:
- (I) Constructed of materials that are:
 - I. Chemically resistant to the waste managed in the landfill and the leachate expected to be generated; and
 - II. Of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the landfill; and
 - (II) Designed and operated to function without clogging through the scheduled closure of the landfill.
2. The owner or operator will be exempted from the requirements of part 1 of this subparagraph if the Commissioner finds, based on a demonstration by the owner or operator, that alternative design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents (see subparagraph (6)(d) of this Rule) into the ground water or surface water at any future time. In deciding whether to grant an exemption, the Commissioner will consider:
- (i) The nature and quantity of the wastes;
 - (ii) The proposed alternate design and operation;
 - (iii) The hydrogeologic setting of the facility, including the attenuative capacity and thickness of the liners and soils present between the landfill and ground water or surface water; and
 - (iv) All other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to ground water or surface water.
3. The owner or operator of each new landfill unit on which construction commences after January 29, 1992, each lateral expansion of a landfill unit on which construction commences after July 29, 1992, and each replacement of an existing landfill unit that is to commence reuse after July 29, 1992 must install two or more liners and a leachate collection and removal system above and between such liners. "Construction commences" is as defined in Rule 1200-1-11-.01(2)(a) under "existing facility".

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- (i) (I) The liner system must include:
 - I. A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period; and
 - II. A composite bottom liner, consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.
- (II) The liners must comply with items 1(i)(I), (II) and (III) of this subparagraph.
- (ii) The leachate collection and removal system immediately above the top liner must be designed, constructed, operated, and maintained to collect and remove leachate from the landfill during the active life and post-closure care period. The Commissioner will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 cm (one foot). The leachate collection and removal system must comply with items (iii)(III) and (IV) of this part.
- (iii) The leachate collection and removal system between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a leak detection system. This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:
 - (I) Constructed with a bottom slope of one percent or more;
 - (II) Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-2} cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10^{-5} m²/sec or more;
 - (III) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill;
 - (IV) Designed and operated to minimize clogging during the active life and post-closure care period; and

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- (V) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit must have its own sump(s). The design of each sump and removal system must provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.
 - (iv) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.
 - (v) The owner or operator of a leak detection system that is not located completely above the seasonal high water table must demonstrate that the operation of the leak detection system will not be adversely affected by the presence of ground water.
4. The Commissioner may approve alternative design or operating practices to those specified in part 3 of this subparagraph if the owner or operator demonstrates to the Commissioner that such design and operating practices, together with location characteristics:
- (i) Will prevent the migration of any hazardous constituent into the ground water or surface water at least as effectively as the liners and leachate collection and removal systems specified in part 3 of this subparagraph; and
 - (ii) Will allow detection of leaks of hazardous constituents through the top liner at least as effectively.
5. The double liner requirement set forth in part 3 of this subparagraph may be waived by the Commissioner for any monofill, if:
- (i) The monofill contains only hazardous wastes from foundry furnace emission controls or metal casting molding sand, and such wastes do not contain constituents which would render the wastes hazardous for reasons other than the Toxicity Characteristic in Rule 1200-1-11-.02(3)(e), with Hazardous Waste Codes D004 through D017; and
 - (ii)
 - (I)
 - I. The monofill has at least one liner for which there is no evidence that such liner is leaking;
 - II. The monofill is located more than one-quarter mile from an underground source of drinking water (as that term is defined in Rule 1200-1-11-.01(2)(a)); and
 - III. The monofill is in compliance with generally applicable ground-water monitoring requirements for facilities with permits under T.C.A. Section 68-212-108 of the Act; or
 - (II) The owner or operator demonstrates that the monofill is located, designed and operated so as to assure that there will be no migration of any hazardous constituent into ground water or surface water at any future time.

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6. The owner or operator of any replacement landfill unit is exempt from part 3 of this subparagraph if:
 - (i) The existing unit was constructed in compliance with the design standards of paragraph (11) of this Rule; and
 - (ii) There is no reason to believe that the liner is not functioning as designed.
 7. The owner or operator must design, construct, operate, and maintain a run-on control system capable of preventing flow onto the active portion of the landfill during peak discharge from at least a 25-year storm.
 8. The owner or operator must design, construct, operate, and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 25-year storm.
 9. Collection and holding facilities (e.g., tanks or basins) associated with run-on and run-off control systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.
 10. If the landfill contains any particulate matter which may be subject to wind dispersal, the owner or operator must cover or otherwise manage the landfill to control wind dispersal.
 11. The Commissioner will specify in the permit all design and operating practices that are necessary to ensure that the requirements of this subparagraph are satisfied.
 12. The owner or operator must not accept a hazardous waste from a particular generating facility for landfilling unless and until such action has been specifically authorized either in the permit (as, for example, for an on-site facility permitted to handle a specific waste stream) or in a written approval granted by the Commissioner (in accordance with subparts (i) and (ii) of this part) pursuant to a case-by-case request from the owner or operator.
 - (i) Such case-by-case requests must be submitted to the Commissioner in duplicate, and must include the waste analysis information the owner or operator has obtained under subparagraph (2)(d) of this Rule and any other information the Commissioner might reasonably require. Such a request shall not be considered by the Commissioner unless the subject hazardous waste falls within the scope of those hazardous wastes which the landfill is allowed to handle under the facility permit.
 - (ii) The Commissioner shall not approve the landfilling of a hazardous waste if he or she finds that:
 - (I) The waste, because of its high toxicity, tendency to leach or migrate, or other characteristic, represents an unusually high danger to public health or the environment; and
 - (II) An alternative to land disposal which is both technologically and economically feasible exists.
- (c) Action Leakage Rate [40 CFR 264.302]

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1. The Commissioner shall approve an action leakage rate for surface impoundment units subject to parts (b)3 or 4 of this paragraph. The action leakage rate is the maximum design flow rate that the leak detection system (LDS) can remove without the fluid head on the bottom liner exceeding 1 foot. The action leakage rate must include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation, and location of the LDS, waste and leachate characteristics, likelihood and amounts of other sources of liquids in the LDS, and proposed response actions (e.g., the action leakage rate must consider decreases in the flow capacity of the system over time resulting from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.).
 2. To determine if the action leakage rate has been exceeded, the owner or operator must convert the weekly or monthly flow rate from the monitoring data obtained under part (d)3 of this paragraph to an average daily flow rate (gallons per acre per day) for each sump. Unless the Commissioner approves a different calculation, the average daily flow rate for each sump must be calculated weekly during the active life and closure period, and monthly during the post-closure care period when monthly monitoring is required under part (d)3 of this paragraph.
- (d) Monitoring and Inspection [40 CFR 264.303]
1. During construction or installation, liners (except in the case of existing portions of landfills exempt from part (b)1 of this paragraph) and cover systems (e.g., membranes, sheets, or coatings) must be inspected for uniformity, damage, and imperfections (e.g., holes, cracks, thin spots, or foreign materials). Immediately after construction or installation:
 - (i) Synthetic liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters; and
 - (ii) Soil-based and admixed liners and covers must be inspected for imperfections including lenses, cracks, channels, root holes, or other structural non-uniformities that may cause an increase in the permeability of the liner or cover.
 2. While a landfill is in operation, it must be inspected weekly and after storms to detect evidence of any of the following:
 - (i) Deterioration, malfunctions, or improper operation of run-on and run-off control systems;
 - (ii) Proper functioning of wind dispersal control systems, where present; and
 - (iii) The presence of leachate in and proper functioning of leachate collection and removal systems, where present.
 3.
 - (i) An owner or operator required to have a leak detection system under parts (b)3 or 4 of this subparagraph must record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.
 - (ii) After the final cover is installed, the amount of liquids removed from each leak detection system sump must be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the

amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months.

- (iii) "Pump operating level" is a liquid level proposed by the owner or operator and approved by the Commissioner based on pump activation level, sump dimensions, and level that avoids backup into the drainage layer and minimizes head in the sump.

(e) Response Actions [40 CFR 264.304]

1. The owner or operator of landfill units subject to parts (b)3 or 4 of this paragraph must have an approved response action plan before receipt of waste. The response action plan must set forth the actions to be taken if the action leakage rate has been exceeded. At a minimum, the response action plan must describe the actions specified in part 2 of this subparagraph.
2. If the flow rate into the leak detection system exceeds the action leakage rate for any sump, the owner or operator must:
 - (i) Notify the Commissioner in writing of the exceedence within 7 days of the determination;
 - (ii) Submit a preliminary written assessment to the Commissioner within 14 days of the determination, as to the amount of liquids, likely sources of liquids, possible location, size, and cause of any leaks, and short-term actions taken and planned;
 - (iii) Determine to the extent practicable the location, size, and cause of any leak;
 - (iv) Determine whether waste receipt should cease or be curtailed, whether any waste should be removed from the unit for inspection, repairs, or controls, and whether or not the unit should be closed;
 - (v) Determine any other short-term and longer-term actions to be taken to mitigate or stop any leaks; and
 - (vi) Within 30 days after the notification that the action leakage rate has been exceeded, submit to the Commissioner the results of the analyses specified in subparts (e)2(iii),(iv) and (v) of this paragraph, the results of actions taken, and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the owner or operator must submit to the Commissioner a report summarizing the results of any remedial actions taken and actions planned.
3. To make the leak and/or remediation determinations in subparts (e)2(iii), (iv), and (v) of this paragraph, the owner or operator must:
 - (i) (I) Assess the source of liquids and amounts of liquids by source,

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- (II) Conduct a fingerprint, hazardous constituent, or other analyses of the liquids in the leak detection system to identify the source of liquids and possible location of any leaks, and the hazard and mobility of the liquid; and
 - (III) Assess the seriousness of any leaks in terms of potential for escaping into the environment; or
 - (ii) Document why such assessments are not needed.
- (f)-(i) (RESERVED) [40 CFR 264.305 - 264.308]
- (j) Surveying and Recordkeeping [40 CFR 264.309]
- The owner or operator of a landfill must maintain the following items in the operating record required under subparagraph (5)(d) of this Rule:
- 1. On a map, the exact location and dimensions, including depth, of each cell with respect to permanently surveyed benchmarks; and
 - 2. The contents of each cell and the approximate location of each hazardous waste type within each cell.
- (k) Closure and Post-closure Care [40 CFR 264.310]
- 1. At final closure of the landfill or upon closure of any cell, the owner or operator must cover the landfill or cell with a final cover designed and constructed to:
 - (i) Provide long-term minimization of migration of liquids through the closed landfill;
 - (ii) Function with minimum maintenance;
 - (iii) Promote drainage and minimize erosion or abrasion of the cover;
 - (iv) Accommodate settling and subsidence so that the cover's integrity is maintained; and
 - (v) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.
 - 2. After final closure, the owner or operator must comply with all post-closure requirements contained in subparagraphs (7)(h)-(k) of this Rule, including maintenance and monitoring throughout the post-closure care period (specified in the permit under subparagraph (7)(h) of this Rule). The owner or operator must:
 - (i) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;
 - (ii) Continue to operate the leachate collection and removal system until leachate is no longer detected;

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- (iii) Maintain and monitor the leak detection system in accordance with item (b)3(iii)(IV) and subpart (b)3(iv) and part (d)3 of this paragraph, and comply with all other applicable leak detection system requirements of this Rule;
 - (iv) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of paragraph (6) of this Rule;
 - (v) Prevent run-on and run-off from eroding or otherwise damaging the final cover; and
 - (vi) Protect and maintain surveyed benchmarks used in complying with subparagraph (j) of this paragraph.
- (l) (RESERVED) [40 CFR 264.311]
- (m) Special Requirements for Ignitable or Reactive Waste [40 CFR 264.312]
- 1. Except as provided in part 2 of this subparagraph, and in subparagraph (q) of this paragraph, ignitable or reactive waste must not be placed in a landfill, unless the waste and landfill meet all applicable requirements of Rule 1200-1-11-.10, and:
 - (i) The resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under subparagraph (3)(b) and (d) of Rule 1200-1-11-.02; and
 - (ii) Part (2)(h)2 of this Rule is complied with.
 - 2. Except for prohibited wastes which remain subject to treatment standards in Rule 1200-1-11-.10(3), ignitable wastes in containers may be landfilled without meeting the requirements of part 1 of this subparagraph,, provided that the wastes are disposed of in such a way that they are protected from any material or conditions which may cause them to ignite. At a minimum, ignitable wastes must be disposed of in non-leaking containers which are carefully handled and placed so as to avoid heat, sparks, rupture, or any other condition that might cause ignition of the wastes; must be covered daily with soil or other non-combustible material to minimize the potential for ignition of the wastes; and must not be disposed of in cells that contain or will contain other wastes which may generate heat sufficient to cause ignition of the waste.
- (n) Special Requirements for Incompatible Wastes [40 CFR 264.313]
- Incompatible wastes, or incompatible wastes and materials, (see Appendix V of paragraph (57) of this Rule for examples) must not be placed in the same landfill cell, unless part (2)(h)2 of this Rule is complied with.
- (o) Special Requirements for Bulk and Containerized Liquids [40 CFR 264.314]
- 1. (Reserved) [40 CFR 264.314(a)]

(Note: Implementation of this provision remains with EPA.)

- 2. Effective February 2, 1986, the placement of bulk or non-containerized liquid hazardous waste or hazardous waste containing free liquids (whether or not sorbents have been added) in any landfill is prohibited.

(Note: Implementation of this provision between May 8, 1985 and February 2, 1986 remains with EPA.)

3. To demonstrate the absence or presence of free liquids in either a containerized or a bulk waste, the following test must be used: Method 9095 (Paint Filter Liquids Test) as described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (see Rule 1200-1-11-.01(2)(b)).
4. Containers holding free liquids must not be placed in a landfill unless:
 - (i) All free-standing liquid:
 - (I) has been removed by decanting, or other methods;
 - (II) has been mixed with sorbent or solidified so that free-standing liquid is no longer observed; or
 - (III) has been otherwise eliminated; or
 - (ii) The container is very small, such as an ampule; or
 - (iii) The container is designed to hold free liquids for use other than storage, such as a battery or capacitor; or
 - (iv) The container is a lab pack as defined in subparagraph (q) of this paragraph and is disposed of in accordance with that subparagraph.
5. Sorbents used to treat free liquids to be disposed of in landfills must be nonbiodegradable. Nonbiodegradable sorbents are: materials listed or described in subpart 1 of this part; materials that pass one of the tests in subpart 2 of this part; or materials that are determined to be nonbiodegradable through the Rule 1200-1-11-.01 petition process.
 - (i) Nonbiodegradable Sorbents
 - (I) Inorganic minerals, other inorganic materials, and elemental carbon (e.g., aluminosilicates, clays, smectites, Fuller's earth, bentonite, calcium bentonite, montmorillonite, calcined montmorillonite, kaolinite, micas (illite), vermiculites, zeolites; calcium carbonate (organic free limestone); oxides/hydroxides, alumina, lime, silica (sand), diatomaceous earth; perlite (volcanic glass); expanded volcanic rock; volcanic ash; cement kiln dust; fly ash; rice hull ash; activated charcoal/activated carbon); or
 - (II) High molecular weight synthetic polymers (e.g., polyethylene, high density polyethylene (HDPE), polypropylene, polystyrene, polyurethane, polyacrylate, polynorborene, polyisobutylene, ground synthetic rubber, cross-linked allylstyrene and tertiary butyl copolymers). This does not include polymers derived from biological material or polymers specifically designed to be degradable; or
 - (III) Mixtures of these nonbiodegradable materials.
 - (ii) Tests for Nonbiodegradable Sorbents

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- (I) The sorbent material is determined to be nonbiodegradable under ASTM Method G21-70 (1984a)-Standard Practice for Determining Resistance of Synthetic Polymer Materials to Fungi; or
 - (II) The sorbent material is determined to be nonbiodegradable under ASTM Method G22-76 (1984b)-Standard Practice for Determining Resistance of Plastics to Bacteria; or
 - (III) The sorbent material is determined to be non-biodegradable under OECD test 301B: [CO₂ Evolution (Modified Sturm Test)].
6. Effective February 2, 1986, the placement of any liquid which is not a hazardous waste in a landfill is prohibited unless the owner or operator of such landfill demonstrates to the Commissioner, or the Commissioner determines, that:
- (i) The only reasonably available alternative to the placement in such landfill is placement in a landfill or unlined surface impoundment, whether or not permitted or operating under interim status, which contains, or may reasonably be anticipated to contain, hazardous waste; and
 - (ii) Placement in such owner or operator's landfill will not present a risk of contamination of any underground source of drinking water (as that term is defined in 40 CFR 144.3).
- (p) Special Requirements for Containers [40 CFR 264.315]
- Unless they are very small, such as an ampule, containers must be either:
- 1. At least 90 percent full when placed in the landfill; or
 - 2. Crushed, shredded, or similarly reduced in volume to the maximum practical extent before burial in the landfill.
- (q) Disposal of Small Containers of Hazardous Waste in Overpacked Drums (Lab Packs) [40 CFR 264.316]
- Small containers of hazardous waste in overpacked drums (lab packs) may be placed in a landfill if the following requirements are met:
- 1. Hazardous waste must be packaged in non-leaking inside containers. The inside containers must be of a design and constructed of a material that will not react dangerously with, be decomposed by, or be ignited by the contained waste. Inside containers must be tightly and securely sealed. The inside containers must be of the size and type specified in the Department of Transportation (DOT) hazardous materials regulations (49 CFR parts 173, 178, and 179), if those regulations specify a particular inside container for the waste.
 - 2. The inside containers must be overpacked in an open head DOT-specification metal shipping container (49 CFR parts 178 and 179) of no more than 416-liter (110 gallon) capacity and surrounded by, at a minimum, a sufficient quantity of sorbent material, determined to be nonbiodegradable in accordance with Rule 1200-1-11-.06(14)(o)5, to completely sorb all of the liquid contents of the inside containers. The metal outer container must be full after it has been packed with inside containers and sorbent material.

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3. The sorbent material used must not be capable of reacting dangerously with, being decomposed by, or being ignited by the contents of the inside containers, in accordance with part (2)(h)2 of this Rule.
 4. Incompatible wastes, as defined in Rule 1200-1-11-.01(2)(a), must not be placed in the same outside container.
 5. Reactive wastes, other than cyanide- or sulfide-bearing waste as defined in Rule 1200-1-11-.02(3)(d)1(v), must be treated or rendered non-reactive prior to packaging in accordance with parts 1 through 4 of this subparagraph. Cyanide- and sulfide-bearing reactive waste may be packed in accordance with parts 1 through 4 of this subparagraph without first being treated or rendered non-reactive.
 6. Such disposal is in compliance with the requirements of Rule 1200-1-11-.10. Persons who incinerate lab packs according to the requirements in Rule 1200-1-11-.10(3)(c)3(i) may use fiber drums in place of metal outer containers. Such fiber drums must meet the DOT specifications in 49 CFR 173.12 and be overpacked according to the requirements in part 2 of this subparagraph.
- (r) Special Requirements for Hazardous Wastes F020, F021, F022, F023, F026, and F027 [40 CFR 264.317]
1. Hazardous Wastes F020, F021, F022, F023, F026, and F027 must not be placed in a landfills unless the owner or operator operates the landfill in accordance with a management plan for these wastes that is approved by the Commissioner pursuant to the standards set out in this subparagraph, and in accord with all other applicable requirements of this Rule. The factors to be considered are:
 - (i) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through the soil or to volatilize or escape into the atmosphere;
 - (ii) The attenuative properties of underlying and surrounding soils or other materials;
 - (iii) The mobilizing properties of other materials co-disposed with these wastes; and
 - (iv) The effectiveness of additional treatment, design, or monitoring requirements.
 2. The Commissioner may determine that additional design, operating, and monitoring requirements are necessary for landfills managing hazardous wastes F020, F021, F022, F023, F026, and F027 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.
- (15) Incinerators [40 CFR 264 Subpart O]
- (a) Applicability [40 CFR 264.340]
1. The regulations of this paragraph apply to owners and operators of hazardous waste incinerators (as defined in Rule 1200-1-11-.01(2)(a)), except as subparagraph (1)(b) of this Rule provides otherwise.
 2. Integration of the MACT standards

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- (i) Except as provided by subparts 2(ii), (iii), and (iv) of this subparagraph, the standards of this Rule no longer apply when an owner or operator demonstrates compliance with the maximum achievable control technology (MACT) requirements of 40 CFR 63 Subpart EEE by conducting a comprehensive performance test and submitting to the Commissioner a Notification of Compliance under 40 CFR 63.1207(j) and 63.1210(b) documenting compliance with the requirements of 40 CFR 63 Subpart EEE. Nevertheless, even after this demonstration of compliance with the MACT standards, Hazardous Waste permit conditions that were based on the standards of this Rule will continue to be in effect until they are removed from the permit or the permit is terminated or revoked, unless the permit expressly provides otherwise.
 - (ii) The MACT standards do not replace the closure requirements of subparagraph (15)(1) or the applicable requirements of paragraphs (1) through (8), (31), and (32) of this Rule.
 - (iii) The particulate matter standard of part (d)3 of this paragraph remains in effect for incinerators that elect to comply with the alternative to the particulate matter standard of §63.1206(b)(14).
 - (iv) The following requirements remain in effect for startup, shutdown, and malfunction events if you elect to comply with item (12)(a)1(i)(I) of Rule 1200-1-11-.07 to minimize emissions of toxic compounds from these events:
 - (I) Part (15)(f)1 of this Rule requiring that an incinerator operate in accordance with operating requirements specified in the permit; and
 - (II) Part (15)(f)3 of this Rule requiring compliance with the emission standards and operating requirements during startup and shutdown if hazardous waste is in the combustion chamber, except for particular hazardous wastes.
3. After consideration of the waste analysis included with Part B of the permit application, the Commissioner, in establishing the permit conditions, must exempt the applicant from all requirements of this paragraph except subparagraph (b) of this paragraph (Waste analysis) and subparagraph (l) of this paragraph (Closure),
- (i) If the Commissioner finds that the waste to be burned is:
 - (I) Listed as a hazardous waste in Rule 1200-1-11-.02(4) solely because it is ignitable (Hazard Code I), corrosive (Hazard Code C), or both; or
 - (II) Listed as a hazardous waste in Rule 1200-1-11-.02(4) solely because it is reactive (Hazard Code R) for characteristics other than those listed in Rule 1200-1-11-.02(3)(d)1(iv) and (v), and will not be burned when other hazardous wastes are present in the combustion zone; or
 - (III) A hazardous waste solely because it possesses the characteristic of ignitability, corrosivity, or both, as determined by the test for characteristics of hazardous wastes under Rule 1200-1-11-.02(3); or

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- (IV) A hazardous waste solely because it possesses any of the reactivity characteristics described by Rule 1200-1-11-.02(3)(d)1(i), (ii), (iii), (vi), (vii) and (viii), and will not be burned when other hazardous wastes are present in the combustion zone; and
 - (ii) If the waste analysis shows that the waste contains none of the hazardous constituents listed in Appendix VIII of Rule 1200-1-11-.02, which would reasonably be expected to be in the waste.
 - 4. If the waste to be burned is one which is described by items 3(i)(I) through (IV) of this subparagraph and contains insignificant concentrations of the hazardous constituents listed in Appendix VIII of Rule 1200-1-11-.02, then the Commissioner may, in establishing permit conditions, exempt the applicant from all requirements of this paragraph, except subparagraph (b) of this paragraph (Waste analysis) and subparagraph (I) of this paragraph (Closure), after consideration of the waste analysis included with Part B of the permit application, unless the Commissioner finds that the waste will pose a threat to human health and the environment when burned in an incinerator.
 - 5. The owner or operator of an incinerator may conduct trial burns subject only to the requirements of Rule 1200-1-11-.07(1)(e) (Short term and incinerator permits).
- (b) Waste Analysis [40 CFR 264.341]
- 1. As a portion of the trial burn plan required by Rule 1200-1-11-.07(1)(e), or with Part B of the permit application, the owner or operator must have included an analysis of the waste feed sufficient to provide all information required by part (1)(e)2 or part (5)(b)5 of Rule 1200-1-11-.07. Owners or operators of new hazardous waste incinerators must provide the information required by part (1)(e)3 or (5)(b)5 of Rule 1200-1-11-.07 to the greatest extent possible.
 - 2. Throughout normal operation the owner or operator must conduct sufficient waste analysis to verify that waste feed to the incinerator is within the physical and chemical composition limits specified in his permit (under part (f)2 of this paragraph).
- (c) Principal Organic Hazardous Constituents (POHCs) [40 CFR 264.342]
- 1. Principal Organic Hazardous Constituents (POHCs) in the waste feed must be treated to the extent required by the performance standard of subparagraph (d) of this paragraph.
 - 2.
 - (i) One or more POHCs will be specified in the facility's permit, from among those constituents listed in Appendix VIII of Rule 1200-1-11-.02, for each waste feed to be burned. This specification will be based on the degree of difficulty of incineration of the organic constituents in the waste and on their concentration or mass in the waste feed, considering the results of waste analyses and trial burns or alternative data submitted with Part B of the facility's permit application. Organic constituents which represent the greatest degree of difficulty of incineration will be those most likely to be designated as POHCs. Constituents are more likely to be designated as POHCs if they are present in large quantities or concentrations in the waste.
 - (ii) Trial POHCs will be designated for performance of trial burns in accordance with the procedure specified in Rule 1200-1-11-.07(1)(e) for obtaining trial burn permits.

(d) Performance Standards [40 CFR 264.343]

An incinerator burning hazardous waste must be designed, constructed, and maintained so that, when operated in accordance with operating requirements specified under subparagraph (f) of this paragraph, it will meet the following performance standards:

1. (i) Except as provided in subpart (ii) of this part, an incinerator burning hazardous waste must achieve a destruction and removal efficiency (DRE) of 99.99% for each principal organic hazardous constituent (POHC) designated (under subparagraph (c) of this paragraph) in its permit for each waste feed. DRE is determined for each POHC from the following equation:

$$DRE = \frac{W_{in} - W_{out}}{W_{in}} \times 100\%$$

where:

W_{in} = mass feed rate of one principal organic hazardous constituent (POHC) in the waste stream feeding the incinerator

and

W_{out} = mass emission rate of the same POHC present in exhaust emissions prior to release to the atmosphere.

- (ii) An incinerator burning hazardous wastes F020, F021, F022, F023, F026, or F027 must achieve a destruction and removal efficiency (DRE) of 99.9999% for each principal organic hazardous constituent (POHC) designated (under subparagraph (c) of this paragraph) in its permit. This performance must be demonstrated on POHCs that are more difficult to incinerate than tetra-, penta-, and hexachlorodibenzo-p-dioxins and dibenzofurans. DRE is determined for each POHC from the equation in subpart (i) of this part. In addition, the owner or operator of the incinerator must notify the Commissioner of his intent to incinerate hazardous wastes F020, F021, F022, F023, F026, or F027.
2. An incinerator burning hazardous waste and producing stack emissions of more than 1.8 kilograms per hour (4 pounds per hour) of hydrogen chloride (HCl) must control HCl emissions such that the rate of emission is no greater than the larger of either 1.8 kilograms per hour or 1% of the HCl in the stack gas prior to entering any pollution control equipment.
3. An incinerator burning hazardous waste must not emit particulate matter in excess of 180 milligrams per dry standard cubic meter (0.08 grains per dry standard cubic foot) when corrected for the amount of oxygen in the stack gas according to the formula:

$$P_c = P_m \times \frac{14}{21 - Y}$$

Where P_c is the corrected concentration of particulate matter, P_m is the measured concentration of particulate matter, and Y is the measured concentration of oxygen in the stack gas, using the Orsat method for oxygen analysis of dry flue gas, presented in 40 CFR 60, Appendix A (Method 3). This correction procedure is to be used by all

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hazardous waste incinerators except those operating under conditions of oxygen enrichment. For these facilities, the Commissioner will select an appropriate correction procedure, to be specified in the facility permit.

4. For purposes of permit enforcement, compliance with the operating requirements specified in the permit (under subparagraph (f) of this paragraph) will be regarded as compliance with this section. However, evidence that compliance with those permit conditions is insufficient to ensure compliance with the performance requirements of this section may be "information" justifying modification, revocation, or reissuance of a permit under Rule 1200-1-11-.07(9)(c).

(e) Hazardous Waste Incinerator Permits [40 CFR 264.344]

1. The owner or operator of a hazardous waste incinerator may burn only wastes specified in his permit and only under operating conditions specified for those wastes under subparagraph (f) of this paragraph, except:
 - (i) In approved trial burns under Rule 1200-1-11-.07(1)(e); or
 - (ii) Under exemptions created by subparagraph (a) of this paragraph.
2. Other hazardous wastes may be burned only after operating conditions have been specified in a new permit or a permit modification as applicable. Operating requirements for new wastes may be based on either trial burn results or alternative data included with Part B of a permit application under Rule 1200-1-11-.07(5)(b)5.
3. The permit for a new hazardous waste incinerator must establish appropriate conditions for each of the applicable requirements of this subpart, including but not limited to allowable waste feeds and operating conditions necessary to meet the requirements of subparagraph (f) of this paragraph, sufficient to comply with the following standards:
 - (i) For the period beginning with initial introduction of hazardous waste to the incinerator and ending with initiation of the trial burn, and only for the minimum time required to establish operating conditions required in subpart (ii) of this part, not to exceed a duration of 720 hours operating time for treatment of hazardous waste, the operating requirements must be those most likely to ensure compliance with the performance standards of subparagraph (d) of this paragraph, based on the Commissioner's engineering judgment. The Commissioner may extend the duration of this period once for up to 720 additional hours when good cause for the extension is demonstrated by the applicant.
 - (ii) For the duration of the trial burn, the operating requirements must be sufficient to demonstrate compliance with the performance standards of subparagraph (d) of this paragraph and must be in accordance with the approved trial burn plan;
 - (iii) For the period immediately following completion of the trial burn, and only for the minimum period sufficient to allow sample analysis, data computation, and submission of the trial burn results by the applicant, and review of the trial burn results and modification of the facility permit by the Commissioner, the operating requirements must be those most likely to ensure compliance with the performance standards of subparagraph (d) of this paragraph, based on the Commissioner's engineering judgement.

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- (iv) For the remaining duration of the permit, the operating requirements must be those demonstrated, in a trial burn or by alternative data specified in Rule 1200-1-11-.07(5)(b)5(iii), as sufficient to ensure compliance with the performance standards of subparagraph (d) of this paragraph.
- (f) Operating Requirements [40 CFR 264.345]
- 1. An incinerator must be operated in accordance with operating requirements specified in the permit. These will be specified on a case-by-case basis as those demonstrated (in a trial burn or in alternative data as specified in part (e)2 of this paragraph and included with Part B of a facility's permit application) to be sufficient to comply with the performance standards of subparagraph (d) of this paragraph.
 - 2. Each set of operating requirements will specify the composition of the waste feed (including acceptable variations in the physical or chemical properties of the waste feed which will not affect compliance with the performance requirement of subparagraph (d) of this paragraph) to which the operating requirements apply. For each such waste feed, the permit will specify acceptable operating limits including the following conditions:
 - (i) Carbon monoxide (CO) level in the stack exhaust gas;
 - (ii) Waste feed rate;
 - (iii) Combustion temperature;
 - (iv) An appropriate indicator of combustion gas velocity;
 - (v) Allowable variations in incinerator system design or operating procedures; and
 - (vi) Such other operating requirements as are necessary to ensure that the performance standards of subparagraph (d) of this paragraph are met.
 - 3. During start-up and shut-down of an incinerator, hazardous waste (except wastes exempted in accordance with subparagraph (a) of this paragraph) must not be fed into the incinerator unless the incinerator is operating within the conditions of operation (temperature, air feed rate, etc.) specified in the permit.
 - 4. Fugitive emissions from the combustion zone must be controlled by:
 - (i) Keeping the combustion zone totally sealed against fugitive emissions; or
 - (ii) Maintaining a combustion zone pressure lower than atmospheric pressure; or
 - (iii) An alternate means of control demonstrated (with part B of the permit application) to provide fugitive emissions control equivalent to maintenance of combustion zone pressure lower than atmospheric pressure.
 - 5. An incinerator must be operated with a functioning system to automatically cut off waste feed to the incinerator when operating conditions deviate from limits established under part 1 of this subparagraph.
 - 6. An incinerator must cease operation when changes in waste feed, incinerator design, or operating conditions exceed limits designated in its permit.

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(g) (RESERVED) [40 CFR 264.346]

(h) Monitoring and Inspections [40 CFR 264.347]

1. The owner or operator must conduct, as a minimum, the following monitoring while incinerating hazardous waste:
 - (i) Combustion temperature, waste feed rate, and the indicator of combustion gas velocity specified in the facility permit must be monitored on a continuous basis.
 - (ii) CO must be monitored on a continuous basis at a point in the incinerator downstream of the combustion zone and prior to release to the atmosphere.
 - (iii) Upon request by the Commissioner, sampling and analysis of the waste and exhaust emissions must be conducted to verify that the operating requirements established in the permit achieve the performance standards of subparagraph (d) of this paragraph.
2. The incinerator and associated equipment (pumps, valves, conveyors, pipes, etc.) must be subjected to thorough visual inspection, at least daily, for leaks, spills, fugitive emissions, and signs of tampering.
3. The emergency waste feed cutoff system and associated alarms must be tested at least weekly to verify operability, unless the applicant demonstrates to the Commissioner that weekly inspections will unduly restrict or upset operations and that less frequent inspection will be adequate. At a minimum, operational testing must be conducted at least monthly.
4. This monitoring and inspection data must be recorded and the records must be placed in the operating log required by subparagraph (5)(d) of this Rule.

(i)-(k) (RESERVED) [40 CFR 264.348-264.350]

(l) Closure [40 CFR 264.351]

At closure the owner or operator must remove all hazardous waste and hazardous waste residues (including, but not limited to, ash, scrubber waters, and scrubber sludges) from the incinerator site.

(Comment: At closure, as throughout the operating period, unless the owner or operator can demonstrate, in accordance with Rule 1200-1-11-.02(1)(c)4, that the residue removed from the incinerator is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with applicable requirements of Rules 1200-1-11-.03 through .07 and .09.)

(16) Thermal Treatment

The regulations of Rule 1200-1-11-.05(16)(d), (f), (h), (l), and (m) apply to owners and operators of facilities that thermally treat hazardous waste in devices other than incinerators, except as subparagraph (1)(b) of this Rule provides otherwise. Thermal treatment in incinerators is subject to the requirements of paragraph (15) of this Rule.

(17) Chemical, Physical, and Biological Treatment

The regulations of Rule 1200-1-11-.05(17)(b), (c), (d), (e), (f), and (g) apply to owners and operators of facilities which treat hazardous waste by chemical, physical, or biological methods in other than tanks, surface impoundments, and land treatment facilities, except as subparagraph (1)(b) of this Rule provides otherwise. Chemical, physical, and biological treatment of hazardous waste in tanks, surface impoundments, and land treatment facilities must be conducted in accordance with paragraphs (10), (11), and (13) of this Rule, respectively.

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(18) Underground Injection

Except as subparagraph (1)(b) of this Rule provides otherwise:

- (a) The owner or operator of a facility which disposes of hazardous waste by underground injection is excluded from the requirements of paragraphs (7) and (8) of this Rule.

(19) - (21) (RESERVED) [40 CFR 264 Subparts P-R]

(22) Special Provisions for Cleanup [40 CFR 264 Subpart S]

(a) Applicability of Corrective Action Management Unit (CAMU) Regulations [40 CFR 264.550]

1. Except as provided in part 2 of this subparagraph, CAMUs are subject to the requirements of subparagraph (22)(c) of this Rule.
2. CAMUs that were approved before April 22, 2002, or for which substantially complete applications (or equivalents) were submitted to the Department on or before November 20, 2000, are subject to the requirements in subparagraph (22)(b) of this Rule for grandfathered CAMUs; CAMU waste, activities, and design will not be subject to the standards in subparagraph (22)(c) of this Rule, so long as the waste, activities, and design remain within the general scope of the CAMU as approved.

(b) Grandfathered Corrective Action Management Units (CAMUs) [40 CFR 264.551]

1. To implement remedies under subparagraph (6)(l) of this Rule, or to implement remedies at a permitted facility that is not subject to subparagraph (6)(l) of this Rule, the Commissioner may designate an area at the facility as a corrective action management unit under the requirements in this subparagraph. Corrective action management unit means an area within a facility that is used only for managing remediation wastes for implementing corrective action or cleanup at the facility. A CAMU must be located within the contiguous property under the control of the owner or operator where the wastes to be managed in the CAMU originated. One or more CAMUs may be designated at a facility.
 - (i) Placement of remediation wastes into or within a CAMU does not constitute land disposal of hazardous wastes.
 - (ii) Consolidation or placement of remediation wastes into or within a CAMU does not constitute creation of a unit subject to minimum technology requirements.
2. (i) The Commissioner may designate a regulated unit (as defined in subpart (6)(a)1(ii) of this Rule) as a CAMU, or may incorporate a regulated unit into a CAMU, if:
 - (I) The regulated unit is closed or closing, meaning it has begun the

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- process under Rules 1200-1-11-.05(7)(d) or .06(7)(d), and
- (II) Inclusion of the regulated unit will enhance implementation of protective and reliable remedial actions for the facility.
- (ii) The paragraphs (6), (7), and (8) requirements and the unit-specific requirements of Rules 1200-1-11-.05 or .06 that applied to that regulated unit will continue to apply to that portion of the CAMU after incorporation into the CAMU.
3. The Commissioner shall designate a CAMU in accordance with the following:
- (i) The CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies;
- (ii) Waste management activities associated with the CAMU shall not create unacceptable risks to humans or to the environment resulting from exposure to hazardous wastes or hazardous constituents;
- (iii) The CAMU shall include uncontaminated areas of the facility, only if including such areas for the purpose of managing remediation waste is more protective than management of such wastes at contaminated areas of the facility;
- (iv) Areas within the CAMU, where wastes remain in place after closure of the CAMU, shall be managed and contained so as to minimize future releases, to the extent practicable;
- (v) The CAMU shall enable the use, when appropriate, of treatment technologies (including innovative technologies) to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of wastes that will remain in place after closure of the CAMU; and
- (vi) The CAMU shall, to the extent practicable, minimize the land area of the facility upon which wastes will remain in place after closure of the CAMU.
4. The owner/operator shall provide sufficient information to enable the Commissioner to designate a CAMU in accordance with the criteria in this subparagraph.
5. The Commissioner shall specify, in the permit or order, requirements for CAMUs to include the following:
- (i) The areal configuration of the CAMU.
- (ii) Requirements for remediation waste management to include the specification of applicable design, operation and closure requirements.
- (iii) Requirements for ground water monitoring that are sufficient to:
- (I) Continue to detect and to characterize the nature, extent, concentration, direction, and movement of existing releases of hazardous constituents in ground water from sources located within the CAMU; and

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- (II) Detect and subsequently characterize releases of hazardous constituents to ground water that may occur from areas of the CAMU in which wastes will remain in place after closure of the CAMU.
- (iv) Closure and post-closure requirements.
 - (I) Closure of corrective action management units shall:
 - I. Minimize the need for further maintenance; and
 - II. Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, for areas where wastes remain in place, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, to surface waters, or to the atmosphere.
 - (II) Requirements for closure of CAMUs shall include the following, as appropriate and as deemed necessary by the Commissioner for a given CAMU:
 - I. Requirements for excavation, removal, treatment or containment of wastes;
 - II. For areas in which wastes will remain after closure of the CAMU, requirements for capping of such areas; and
 - III. Requirements for removal and decontamination of equipment, devices, and structures used in remediation waste management activities within the CAMU.
 - (III) In establishing specific closure requirements for CAMUs under part 5 of this subparagraph, the Commissioner shall consider the following factors:
 - I. CAMU characteristics;
 - II. Volume of wastes which remain in place after closure;
 - III. Potential for releases from the CAMU;
 - IV. Physical and chemical characteristics of the waste;
 - V. Hydrological and other relevant environmental conditions at the facility which may influence the migration of any potential or actual release; and
 - VI. Potential for exposure of humans and environmental receptors if releases were to occur from the CAMU.
 - (IV) Post-closure requirements as necessary to protect human health and the environment, to include, for areas where wastes will remain in place, monitoring and maintenance activities, and the frequency with which

such activities shall be performed to ensure the integrity of any cap, final cover, or other containment system.

6. The Commissioner shall document the rationale for designating CAMUs and shall make such documentation available to the public.
7. Incorporation of a CAMU into an existing permit must be approved by the Commissioner according to the procedures for Agency-initiated permit modifications under Rule 1200-1-11-.07(9)(c)2, or according to the permit modification procedures of Rule 1200-1-11-.07(9)(c)5.
8. The designation of a CAMU does not change the Department's existing authority to address clean-up levels, media-specific points of compliance to be applied to remediation at a facility, or other remedy selection decisions.

(c) Corrective Action Management Units (CAMU) [40 CFR 264.552]

1. To implement remedies under subparagraph (6)(l) of this Rule or to implement remedies at a permitted facility that is not subject to subparagraph (6)(l) of this Rule, the Commissioner may designate an area at the facility as a corrective action management unit under the requirements in this subparagraph. Corrective action management unit means an area within a facility that is used only for managing CAMU-eligible wastes for implementing corrective action or cleanup at the facility. A CAMU must be located within the contiguous property under the control of the owner or operator where the wastes to be managed in the CAMU originated. One or more CAMUs may be designated at a facility.

(i) CAMU-eligible waste means:

- (I) All solid and hazardous wastes, and all media (including ground water, surface water, soils, and sediments) and debris, that are managed for implementing cleanup. As-generated wastes (either hazardous or non-hazardous) from ongoing industrial operations at a site are not CAMU-eligible wastes.
- (II) Wastes that would otherwise meet the description in item (I) of this subpart are not "CAMU-Eligible Wastes" where:
 - I. The wastes are hazardous wastes found during cleanup in intact or substantially intact containers, tanks, or other non-land-based units found above ground, unless the wastes are first placed in the tanks, containers or non-land-based units as part of cleanup, or the containers or tanks are excavated during the course of cleanup; or
 - II. The Commissioner exercises the discretion in subpart (ii) of this part to prohibit the wastes from management in a CAMU.
- (III) Notwithstanding item (I) of this subpart, where appropriate, as-generated non-hazardous waste may be placed in a CAMU where such waste is being used to facilitate treatment or the performance of the CAMU.

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- (ii) The Commissioner may prohibit, where appropriate, the placement of waste in a CAMU where the Commissioner has or receives information that such wastes have not been managed in compliance with applicable land disposal treatment standards of Rule 1200-1-11-.10, or applicable unit design requirements of this Rule, or applicable unit design requirements of Rule 1200-1-11-.05, or that non-compliance with other applicable requirements of these Rules likely contributed to the release of the waste.
 - (iii) Prohibition against placing liquids in CAMUs.
 - (I) The placement of bulk or noncontainerized liquid hazardous waste or free liquids contained in hazardous waste (whether or not sorbents have been added) in any CAMU is prohibited except where placement of such wastes facilitates the remedy selected for the waste.
 - (II) The requirements in part (14)(o)4 of this Rule for placement of containers holding free liquids in landfills apply to placement in a CAMU except where placement facilitates the remedy selected for the waste.
 - (III) The placement of any liquid which is not a hazardous waste in a CAMU is prohibited unless such placement facilitates the remedy selected for the waste or a demonstration is made pursuant to part (14)(o)6 of this Rule.
 - (IV) The absence or presence of free liquids in either a containerized or a bulk waste must be determined in accordance with part (14)(o)3 of this Rule.) Sorbents used to treat free liquids in CAMUs must meet the requirements of part (14)(o)5 of this Rule.
 - (iv) Placement of CAMU-eligible wastes into or within a CAMU does not constitute land disposal of hazardous wastes.
 - (v) Consolidation or placement of CAMU-eligible wastes into or within a CAMU does not constitute creation of a unit subject to minimum technology requirements.
- 2.
- (i) The Commissioner may designate a regulated unit (as defined in part (6)(a)1(ii) of this Rule as a CAMU, or may incorporate a regulated unit into a CAMU, if :
 - (I) The regulated unit is closed or closing, meaning it has begun the closure process under subparagraph (7)(d) of this Rule or subparagraph (7)(d) of Rule 1200-1-11-.05; and
 - (II) Inclusion of the regulated unit will enhance implementation of effective, protective and reliable remedial actions for the facility.
 - (ii) The paragraphs (6) (7), and (8) requirements and the unit-specific requirements of this Rule or Rule 1200-1-11-.05 that applied to the regulated unit will continue to apply to that portion of the CAMU after incorporation into the CAMU.

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3. The Commissioner shall designate a CAMU that will be used for storage and/or treatment only in accordance with part 6 of this subparagraph. The Commissioner shall designate all other CAMUs in accordance with the following:
 - (i) The CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies;
 - (ii) Waste management activities associated with the CAMU shall not create unacceptable risks to humans or to the environment resulting from exposure to hazardous wastes or hazardous constituents;
 - (iii) The CAMU shall include uncontaminated areas of the facility, only if including such areas for the purpose of managing CAMU-eligible waste is more protective than management of such wastes at contaminated areas of the facility;
 - (iv) Areas within the CAMU, where wastes remain in place after closure of the CAMU, shall be managed and contained so as to minimize future releases, to the extent practicable;
 - (v) The CAMU shall expedite the timing of remedial activity implementation, when appropriate and practicable;
 - (vi) The CAMU shall enable the use, when appropriate, of treatment technologies (including innovative technologies) to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of wastes that will remain in place after closure of the CAMU; and
 - (vii) The CAMU shall, to the extent practicable, minimize the land area of the facility upon which wastes will remain in place after closure of the CAMU.
4. The owner/operator shall provide sufficient information to enable the Commissioner to designate a CAMU in accordance with the criteria in this subparagraph. This must include, unless not reasonably available, information on:
 - (i) The origin of the waste and how it was subsequently managed (including a description of the timing and circumstances surrounding the disposal and/or release);
 - (ii) Whether the waste was listed or identified as hazardous at the time of disposal and/or release; and
 - (iii) Whether the disposal and/or release of the waste occurred before or after the land disposal requirements of Rule 1200-1-11-.10 were in effect for the waste listing or characteristic.
5. The Commissioner shall specify, in the permit or order, requirements for CAMUs to include the following:
 - (i) The areal configuration of the CAMU.
 - (ii) Except as provided in part 7 of this subparagraph, requirements for CAMU-eligible waste management to include the specification of applicable design, operation, treatment and closure requirements.
 - (iii) Minimum design requirements

CAMUs, except as provided in part 6 of this subparagraph, into which wastes are placed must be designed in accordance with the following:

- (I) Unless the Commissioner approves alternate requirements under item (II) of this subpart, CAMUs that consist of new, replacement, or laterally expanded units must include a composite liner and a leachate collection system that is designed and constructed to maintain less than a 30-cm depth of leachate over the liner. For purposes of this subparagraph, composite liner means a system consisting of two components; the upper component must consist of a minimum 30-mil flexible membrane liner (FML), and the lower component must consist of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. FML components consisting of high density polyethylene (HDPE) must be at least 60 mil thick. The FML component must be installed in direct and uniform contact with the compacted soil component;

- (II) Alternate requirements

The Commissioner may approve alternate requirements if:

- I. The Commissioner finds that alternate design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents into the ground water or surface water at least as effectively as the liner and leachate collection systems in item (I) of this subpart; or
- II. The CAMU is to be established in an area with existing significant levels of contamination, and the Commissioner finds that an alternative design, including a design that does not include a liner, would prevent migration from the unit that would exceed long-term remedial goals.

- (iv) Minimum treatment requirements

Unless the wastes will be placed in a CAMU for storage and/or treatment only in accordance with part 6 of this subparagraph, CAMU-eligible wastes that, absent this subparagraph, would be subject to the treatment requirements of Rule 1200-1-11-.10, and that the Commissioner determines contain principal hazardous constituents must be treated to the standards specified in item (III) of this subpart.

- (I) Principal hazardous constituents are those constituents that the Commissioner determines pose a risk to human health and the environment substantially higher than the cleanup levels or goals at the site.

- I. In general, the Commissioner will designate as principal hazardous constituents:

- A. Carcinogens that pose a potential direct risk from ingestion or inhalation at the site at or above 10^{-3} ; and

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- B. Non-carcinogens that pose a potential direct risk from ingestion or inhalation at the site an order of magnitude or greater over their reference dose.
 - II. The Commissioner will also designate constituents as principal hazardous constituents, where appropriate, when risks to human health and the environment posed by the potential migration of constituents in wastes to ground water are substantially higher than cleanup levels or goals at the site; when making such a designation, the Commissioner may consider such factors as constituent concentrations, and fate and transport characteristics under site conditions.
 - III. The Commissioner may also designate other constituents as principal hazardous constituents that the Commissioner determines pose a risk to human health and the environment substantially higher than the cleanup levels or goals at the site.
- (II) In determining which constituents are “principal hazardous constituents,” the Commissioner must consider all constituents which, absent this subparagraph, would be subject to the treatment requirements in Rule 1200-1-11-.10.
 - (III) Waste that the Commissioner determines contains principal hazardous constituents must meet treatment standards determined in accordance with item (IV) or item (V) of this subpart.
 - (IV) Treatment standards for wastes placed in CAMUs
 - I. For non-metals, treatment must achieve 90 percent reduction in total principal hazardous constituent concentrations, except as provided by subitem III of this item.
 - II. For metals, treatment must achieve 90 percent reduction in principal hazardous constituent concentrations as measured in leachate from the treated waste or media (tested according to the TCLP) or 90 percent reduction in total constituent concentrations (when a metal removal treatment technology is used), except as provided by subitem III of this item.
 - III. When treatment of any principal hazardous constituents to at 90 percent reduction standard would result in a concentration less than 10 times the Universal Treatment Standard for that constituent, treatment to achieve constituent concentrations less than 10 times the Universal Treatment Standard is not required. Universal Treatment Standards are identified in subparagraph (3)(i) of Rule 1200-1-11-.10.
 - IV. For waste exhibiting the hazardous characteristic of ignitability, corrosivity or reactivity, the waste must also be treated to eliminate these characteristics.
 - V. For debris, the debris must be treated in accordance with subparagraph (3)(f) of Rule 1200-1-11-.10, or by methods or

to levels established under subitems (iv)(IV)I through IV or item (iv)(V) of this subpart, whichever the Commissioner determines is appropriate.

VI. Alternatives to TCLP

For metal bearing wastes for which metals removal treatment is not used, the Commissioner may specify a leaching test other than the TCLP (SW846 Method 1311, item (2)(b)1(xi) of Rule 1200-1-11-.01 to measure treatment effectiveness, provided the Commissioner determines that an alternative leach testing protocol is appropriate for use, and that the alternative more accurately reflects conditions at the site that affect leaching.

(V) Adjusted standards

The Commissioner may adjust the treatment level or method in item (iv)(IV) of this subpart to a higher or lower level, based on one or more of the following factors, as appropriate. The adjusted level or method must be protective of human health and the environment:

- I. The technical impracticability of treatment to the levels or by the methods in item (iv)(IV) of this subpart;
- II. The levels or methods in item (iv)(IV) of this subpart would result in concentrations of principal hazardous constituents (PHCs) that are significantly above or below cleanup standards applicable to the site (established either site-specifically, or promulgated under state or federal law);
- III. The views of the affected local community on the treatment levels or methods in item (iv)(IV) of this subpart as applied at the site, and, for treatment levels, the treatment methods necessary to achieve these levels;
- IV. The short-term risks presented by the on-site treatment method necessary to achieve the levels or treatment methods in item (iv)(IV) of this subpart;
- V. The long-term protection offered by the engineering design of the CAMU and related engineering controls:
 - A. Where the treatment standards in item (iv)(IV) of this subpart are substantially met and the principal hazardous constituents in the waste or residuals are of very low mobility; or
 - B. Where cost-effective treatment has been used and the CAMU meets the Subtitle C liner and leachate collection requirements for new land disposal units at parts (14)(b)3 and 4 of this Rule; or
 - C. Where, after review of appropriate treatment technologies, the Commissioner determines that cost-effective treatment is not reasonably available, and the CAMU meets the Subtitle C liner and leachate

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collection requirements for new land disposal units at parts (14)(b)3 and 4 of this Rule; or

- D. Where cost-effective treatment has been used and the principal hazardous constituents in the treated wastes are of very low mobility; or
 - E. Where, after review of appropriate treatment technologies, the Commissioner determines that cost-effective treatment is not reasonably available, the principal hazardous constituents in the wastes are of very low mobility, and either the CAMU meets or exceeds the liner standards for new, replacement, or laterally expanded CAMUs in item (iii)(I) and (II) of this subpart, or the CAMU provides substantially equivalent or greater protection.
- (VI) The treatment required by the treatment standards must be completed prior to, or within a reasonable time after, placement in the CAMU.
- (VII) For the purpose of determining whether wastes placed in CAMUs have met site-specific treatment standards, the Commissioner may, as appropriate, specify a subset of the principal hazardous constituents in the waste as analytical surrogates for determining whether treatment standards have been met for other principal hazardous constituents. This specification will be based on the degree of difficulty of treatment and analysis of constituents with similar treatment properties.
- (v) Except as provided in part 6 of this subparagraph, requirements for ground water monitoring and corrective action that are sufficient to:
- (I) Continue to detect and to characterize the nature, extent, concentration, direction, and movement of existing releases of hazardous constituents in ground water from sources located within the CAMU; and
 - (II) Detect and subsequently characterize releases of hazardous constituents to ground water that may occur from areas of the CAMU in which wastes will remain in place after closure of the CAMU; and
 - (III) Require notification to the Commissioner and corrective action as necessary to protect human health and the environment for releases to ground water from the CAMU.
- (vi) Except as provided in part 6 of this subparagraph, closure and post-closure requirements:
- (I) Closure of corrective action management units shall:
 - I. Minimize the need for further maintenance; and
 - II. Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, for areas where wastes remain in place, post-closure escape of hazardous

wastes, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, to surface waters, or to the atmosphere.

- (II) Requirements for closure of CAMUs shall include the following, as appropriate and as deemed necessary by the Commissioner for a given CAMU:
- I. Requirements for excavation, removal, treatment or containment of wastes; and
 - II. Requirements for removal and decontamination of equipment, devices, and structures used in CAMU-eligible waste management activities within the CAMU.
- (III) In establishing specific closure requirements for CAMUs under part 5 of this subparagraph, the Commissioner shall consider the following factors:
- I. CAMU characteristics;
 - II. Volume of wastes which remain in place after closure;
 - III. Potential for releases from the CAMU;
 - IV. Physical and chemical characteristics of the waste;
 - V. Hydrological and other relevant environmental conditions at the facility which may influence the migration of any potential or actual releases; and
 - VI. Potential for exposure of humans and environmental receptors if releases were to occur from the CAMU.
- (IV) Cap requirements:
- I. At final closure of the CAMU, for areas in which wastes will remain after closure of the CAMU, with constituent concentrations at or above remedial levels or goals applicable to the site, the owner or operator must cover the CAMU with a final cover designed and constructed to meet the following performance criteria, except as provided in subitem II of this item:
 - A. Provide long-term minimization of migration of liquids through the closed unit;
 - B. Function with minimum maintenance;
 - C. Promote drainage and minimize erosion or abrasion of the cover;
 - D. Accommodate settling and subsidence so that the cover's integrity is maintained; and

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- E. Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.
 - II. The Commissioner may determine that modifications to subitem I of this item are needed to facilitate treatment or the performance of the CAMU (e. g., to promote biodegradation).
 - (V) Post-closure requirements as necessary to protect human health and the environment, to include, for areas where wastes will remain in place, monitoring and maintenance activities, and the frequency with which such activities shall be performed to ensure the integrity of any cap, final cover, or other containment system.
6. CAMUs used for storage and/or treatment only are CAMUs in which wastes will not remain after closure. Such CAMUs must be designated in accordance with all of the requirements of this subparagraph, except as follows:
- (i) CAMUs that are used for storage and/or treatment only and that operate in accordance with the time limits established in the staging pile regulations at item 4(i)(III), part 8, and part 9 of subparagraph (22)(e) of this Rule are subject to the requirements for staging piles at items 4(i)(I) and (II), subpart 4(ii), part 5 and 6, and parts 10 and 11 of subparagraph (22)(e) of this Rule in lieu of the performance standards and requirements for CAMUs in this subparagraph at part 3 and subparts 5 (iii) through (vi).
 - (ii) CAMUs that are used for storage and/or treatment only and that do not operate in accordance with the time limits established in the staging pile regulations at item 4(i)(III), part 8, and part 9 of subparagraph (22)(e) of this Rule:
 - (I) Must operate in accordance with a time limit, established by the Commissioner, that is no longer than necessary to achieve a timely remedy selected for the waste, and
 - (II) Are subject to the requirements for staging piles at items 4(i)(I) and (II), subpart 4(ii), part 5 and part 6, and part 10 and part 11 of subparagraph (22)(e) of this Rule in lieu of the performance standards and requirements for CAMUs in this subparagraph at part 3 and subparts 5(iv) and 5(vi).
7. CAMUs into which wastes are placed where all wastes have constituent levels at or below remedial levels or goals applicable to the site do not have to comply with the requirements for liners at item (iii)(1) of part 5, caps at item (vi)(IV) of part 5, groundwater monitoring requirements at subpart (v) of part 5, or, for treatment and/or storage only CAMUs, the design standards at part 6 of this subparagraph.
8. The Commissioner shall provide public notice and a reasonable opportunity for public comment before designating a CAMU. Such notice shall include the rationale for any proposed adjustments under item 5 (iv)(V) of this subparagraph to the treatment standards in item 5 (iv)(IV) of this subparagraph.

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9. Notwithstanding any other provision of this subparagraph, the Commissioner may impose additional requirements as necessary to protect human health and the environment.
 10. Incorporation of a CAMU into an existing permit must be approved by the Commissioner according to the procedures for Department initiated permit modifications under subparagraph (9)(c) of Rule 1200-1-11-.07 , or according to the permit modification procedures of part (9)(c)5 of Rule 1200-1-11-.07.
 11. The designation of a CAMU does not change the Department's existing authority to address clean-up levels, media-specific points of compliance to be applied to remediation at a facility, or other remedy selection decisions.
- (d) Temporary Units (TU) [40 CFR 264.553]
1. For temporary tanks and container storage areas used to treat or store hazardous remediation wastes during remedial activities required under subparagraph (6)(l) of this Rule, or at a permitted facility that is not subject to subparagraph (6)(l) of this Rule, the Commissioner may designate a unit at the facility as a temporary unit. A temporary unit must be located within the contiguous property under the control of the owner/operator where the wastes to be managed in the temporary unit originated. For temporary units, the Commissioner may replace the design, operating, or closure standard applicable to these units under this Rule or Rule 1200-1-11-.05 with alternative requirements which protect human health and the environment.
 2. Any temporary unit to which alternative requirements are applied in accordance with part 1 of this subparagraph shall be:
 - (i) Located within the facility boundary; and
 - (ii) Used only for treatment or storage of remediation wastes.
 3. In establishing standards to be applied to a temporary unit, the Commissioner shall consider the following factors:
 - (i) Length of time such unit will be in operation;
 - (ii) Type of unit;
 - (iii) Volumes of wastes to be managed;
 - (iv) Physical and chemical characteristics of the wastes to be managed in the unit;
 - (v) Potential for releases from the unit;
 - (vi) Hydrogeological and other relevant environmental conditions at the facility which may influence the migration of any potential releases; and
 - (vii) Potential for exposure of humans and environmental receptors if releases were to occur from the unit.
 4. The Commissioner shall specify in the permit or order the length of time a temporary unit will be allowed to operate, to be no longer than a period of one year. The Commissioner shall also specify the design, operating, and closure requirements for the unit.

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5. The Commissioner may extend the operational period of a temporary unit once for no longer than a period of one year beyond that originally specified in the permit or order, if the Commissioner determines that:
 - (i) Continued operation of the unit will not pose a threat to human health and the environment; and
 - (ii) Continued operation of the unit is necessary to ensure timely and efficient implementation of remedial actions at the facility.
6. Incorporation of a temporary unit or a time extension for a temporary unit into an existing permit shall be:
 - (i) Approved in accordance with the procedures for Agency-initiated permit modifications under Rule 1200-1-11-.07(9)(c)2; or
 - (ii) Requested by the owner/operator as a Class II modification according to the procedures under Rule 1200-1-11-.07(9)(c)5.
7. The Commissioner shall document the rationale for designating a temporary unit and for granting time extensions for temporary units and shall make such documentation available to the public.

(e) Staging Piles [40 CFR 264.554]

(Note: This subparagraph is written in a special format to make it easier to understand the regulatory requirements. Like other Department regulations, this establishes enforceable legal requirements. For this "I" and "you" refer to the owner/operator)

1. What is a staging pile? A staging pile is an accumulation of solid, non-flowing remediation waste (as defined in Rule 1200-1-11-.01(2)(a)) that is not a containment building and is used only during remedial operations for temporary storage at a facility. A staging pile must be located within the contiguous property under the control of the owner/operator where the wastes to be managed in the staging pile originated. Staging piles must be designated by the Commissioner in according to the requirements in this subparagraph.
 - (i) For the purposes of this subparagraph, storage includes mixing, sizing, blending, or other similar physical operations as long as they are intended to prepare the wastes for subsequent management or treatment.
 - (ii) [RESERVED]
2. When may I use a staging pile? You may use a staging pile to store hazardous remediation waste (or remediation waste otherwise subject to land disposal restrictions) only if you follow the standards and design criteria the Director has designated for that staging pile. The Commissioner must designate the staging pile in a permit or, at an interim status facility, in a closure plan or order (consistent with Rule 1200-1-11-.07(3)(c)1(v) and 2(v)). The Commissioner must establish conditions in the permit, closure plan, or order that comply with parts 4 through 11 of this subparagraph.
3. What information must I provide to get a staging pile designated? When seeking a staging pile designation, you must provide:

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- (i) Sufficient and accurate information to enable the Commissioner to impose standards and design criteria for your staging pile according to parts 4 through 11 of this subparagraph;
 - (ii) Certification by an independent, qualified, registered professional engineer for technical data, such as design drawings and specifications, and engineering studies, unless the Commissioner determines, based on information that you provide, that this certification is not necessary to ensure that a staging pile will protect human health and the environment; and
 - (iii) Any additional information the Commissioner determines is necessary to protect human health and the environment.
4. What performance criteria must a staging pile satisfy? The Commissioner must establish the standards and design criteria for the staging pile in the permit, closure plan, or order.
- (i) The standards and design criteria must comply with the following:
 - (I) The staging pile must facilitate a reliable, effective and protective remedy;
 - (II) The staging pile must be designed so as to prevent or minimize releases of hazardous wastes and hazardous constituents into the environment, and minimize or adequately control cross-media transfer, as necessary to protect human health and the environment (for example, through the use of liners, covers, run-off/run-on controls, as appropriate); and
 - (III) The staging pile must not operate for more than two years, except when the Commissioner grants an operating term extension under part 9 of this subparagraph (entitled "May I receive an operating extension for a staging pile?"). You must measure the two-year limit, or other operating term specified by the Commissioner in the permit, closure plan, or order, from the first time you place remediation waste into a staging pile. You must maintain a record of the date when you first placed remediation waste into the staging pile for the life of the permit, closure plan, or order, or for three years, whichever is longer
 - (ii) In setting the standards and design criteria, the Commissioner must consider the following factors:
 - (I) Length of time the pile will be in operation;
 - (II) Volumes of wastes you intend to store in the pile;
 - (III) Physical and chemical characteristics of the wastes to be stored in the unit;
 - (IV) Potential for releases from the unit;
 - (V) Hydrogeological and other relevant environmental conditions at the facility that may influence the migration of any potential releases; and

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- (VI) Potential for human and environmental exposure to potential releases from the unit;
5. May a staging pile receive ignitable or reactive remediation waste? You must not place ignitable or reactive remediation waste in a staging pile unless:
- (i) You have treated, rendered or mixed the remediation waste before you placed it in the staging pile so that:
 - (I) The remediation waste no longer meets the definition of ignitable or reactive under Rule 12001-1-11-.02(3)(b) or (d); and
 - (II) You have complied with part (2)(h)2 of this Rule; or
 - (ii) You manage the remediation waste to protect it from exposure to any material or condition that may cause it to ignite or react.
6. How do I handle incompatible remediation wastes in a staging pile? The term "incompatible waste" is defined in Rule 1200-1-11-.01(2)(a). You must comply with the following requirements for incompatible wastes in staging piles:
- (i) You must not place incompatible remediation wastes in the same staging pile unless you have complied with part (2)(h)2 of this Rule;
 - (ii) If remediation waste in a staging pile is incompatible with any waste or material stored nearby in containers, other piles, open tanks or land disposal units (for example, surface impoundments), you must separate the incompatible materials, or protect them from one another by using a dike, berm, wall or other device; and
 - (iii) You must not pile remediation waste on the same base where incompatible wastes or materials were previously piled, unless the base has been decontaminated sufficiently to comply with part (2)(h)2 of this Rule.
7. Are staging piles subject to Land Disposal Restrictions (LDR) and Minimum Technological Requirements (MTR)? No. Placing hazardous remediation wastes into a staging pile does not constitute land disposal of hazardous wastes or create a unit that is subject to the minimum technological requirements of RCRA 3004(o).
8. How long may I operate a staging pile? The Commissioner may allow a staging pile to operate for up to two years after hazardous remediation waste is first placed into the pile. You must use a staging pile no longer than the length of time designated by the Commissioner in the permit, closure plan, or order (the "operating term"), except as provided in part 9 of this subparagraph.
9. May I receive an operating extension for a staging pile?
- (i) The Commissioner may grant one operating term extension of up to 180 days beyond the operating term limit contained in the permit, closure plan, or order (see part 12 of this subparagraph for modification procedures). To justify to the Commissioner the need for an extension, you must provide sufficient and accurate information to enable the Commissioner to determine that continued operation of the staging pile:

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- (I) Will not pose a threat to human health and the environment; and
 - (II) Is necessary to ensure timely and efficient implementation of remedial actions at the facility.
 - (ii) The Commissioner may, as a condition of the extension, specify further standards and design criteria in the permit, closure plan, or order, as necessary, to ensure protection of human health and the environment.
10. What is the closure requirement for a staging pile located in a previously contaminated area?
- (i) Within 180 days after the operating term of the staging pile expires, you must close a staging pile located in a previously contaminated area of the site by removing or decontaminating all:
 - (I) Remediation waste;
 - (II) Contaminated containment system components; and
 - (III) Structures and equipment contaminated with waste and leachate.
 - (ii) You must also decontaminate contaminated subsoils in a manner and according to a schedule that the Commissioner determines will protect human health and the environment.
 - (iii) The Commissioner must include the above requirements in the permit, closure plan, or order in which the staging pile is designated.
11. What is the closure requirement for a staging pile located in an uncontaminated area?
- (i) Within 180 days after the operating term of the staging pile expires, you must close a staging pile located in an uncontaminated area of the site according to part (12)(i)1 and subparagraph (7)(b) of this Rule or according to Rule 1200-1-11-.05(12)(i) and Rule 1200-1-11-.05(7)(b).
 - (ii) The Commissioner must include the above requirement in the permit, closure plan, or order in which the staging pile is designated.
12. How may my existing permit (for example, RAP), closure plan, or order be modified to allow me to use a staging pile?
- (i) To modify a permit, other than a RAP, to incorporate a staging pile or staging pile operating term extension, either:
 - (I) The Commissioner must approve the modification under the procedures for Department-initiated permit modifications in Rule 1200-1-11-.07(9)(c); or
 - (II) You must request a Class 2 modification under Rule 1200-1-11-.07(9)(c)5.

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- (ii) To modify a RAP to incorporate a staging pile or staging pile operating term extension, you must comply with the RAP modification requirements under Rule 1200-1-11-.07(11)(d)1 and (d)5.
 - (iii) To modify a closure plan to incorporate a staging pile or staging pile operating term extension, you must follow the applicable requirements under part (7)(c)3 of this Rule or Rule 1200-1-11-.05(7)(c)3.
 - (iv) To modify an order to incorporate a staging pile or staging pile operating term extension, you must follow the terms of the order and the applicable provisions of Rule 1200-1-11-.07(3)(c)1(v) or 2(v).
 - 13. Is information about the staging pile available to the public? The Commissioner must document the rationale for designating a staging pile or staging pile operating term extension and make this documentation available to the public.
- (f) Disposal of CAMU-eligible wastes in permitted hazardous waste landfills [40 CFR 264.555]
- 1. The Commissioner with regulatory oversight at the location where the cleanup is taking place may approve placement of CAMU-eligible wastes in hazardous waste landfills not located at the site from which the waste originated, without the wastes meeting the requirements of Rule 1200-1-11-.10, if the conditions in subparts (i) through (iii) of this part are met.
 - (i) The waste meets the definition of CAMU-eligible waste in subparts 1(i) and (ii) of subparagraph (c) of this paragraph.
 - (ii) The Commissioner with regulatory oversight at the location where the cleanup is taking place identifies principal hazardous constituents in such waste, in accordance with item (c)5(iv)(I) and (II) of this paragraph, and requires that such principal hazardous constituents are treated to any of the following standards specified for CAMU-eligible wastes:
 - (I) The treatment standards under item (c)5(iv)(IV) of this paragraph; or
 - (II) Treatment standards adjusted in accordance with subitems 5(iv)(V)I, III, IV or section 5(iv)(V), V.A of subparagraph (c) of this paragraph.
 - (III) Treatment standards adjusted in accordance with section 5(iv)(V) V.B of subparagraph (c) of this paragraph, where treatment has been used and that treatment significantly reduces the toxicity or mobility of the principal hazardous constituents in the waste, minimizing the short-term and long-term threat posed by the waste, including the threat at the remediation site.
 - (iii) The landfill receiving the CAMU-eligible waste must have a RCRA hazardous waste permit, meet the requirements for new landfills in paragraph (14) of this Rule, and be authorized to accept CAMU-eligible wastes; for the purposes of this requirement, “permit” does not include interim status.
 - 2. The person seeking approval shall provide sufficient information to enable the Commissioner with regulatory oversight at the location where the cleanup is taking place to approve placement of CAMU-eligible waste in accordance with part 1 of this subparagraph. Information required by subparts (c)4(i) through (iii) of this paragraph for

CAMU applications must be provided, unless not reasonably available.

3. The Commissioner with regulatory oversight at the location where the cleanup is taking place shall provide public notice and a reasonable opportunity for public comment before approving CAMU eligible waste for placement in an off-site permitted hazardous waste landfill, consistent with the requirements for CAMU approval at part (c)8 of this paragraph. The approval must be specific to a single remediation.
4. Applicable hazardous waste management requirements in this subparagraph, including recordkeeping requirements to demonstrate compliance with treatment standards approved under this subparagraph, for CAMU-eligible waste must be incorporated into the receiving facility permit through permit issuance or permit modification, providing notice and an opportunity for comment and a hearing. Notwithstanding subparagraph (8)(g) of Rule 1200-1-11-.07 a landfill may not receive hazardous CAMU-eligible waste under this subparagraph unless its permit specifically authorizes receipt of such waste.
5. For each remediation, CAMU-eligible waste may not be placed in an off-site landfill authorized to receive CAMU-eligible waste in accordance with part 4 of this subparagraph until the following additional conditions have been met:
 - (i) The landfill owner/operator notifies the Commissioner responsible for oversight of the landfill and persons on the facility mailing list, maintained in accordance with item (7)(e)3(i)(V) of Rule 1200-1-11-.07, of his or her intent to receive CAMU-eligible waste in accordance with this subparagraph; the notice must identify the source of the remediation waste, the principal hazardous constituents in the waste, and treatment requirements.
 - (ii) Persons on the facility mailing list may provide comments, including objections to the receipt of the CAMU-eligible waste, to the Commissioner within 15 days of the notification.
 - (iii) The Commissioner may object to the placement of the CAMU-eligible waste in the landfill within 30 days of notification; the Commissioner may extend the review period an additional 30 days because of public concerns or insufficient information.
 - (iv) CAMU-eligible wastes may not be placed in the landfill until the Commissioner has notified the facility owner/operator that he or she does not object to its placement.
 - (v) If the Commissioner objects to the placement or does not notify the facility owner/operator that he or she has chosen not to object, the facility may not receive the waste, notwithstanding subparagraph (8)(g) of Rule 1200-1-11-.07, until the objection has been resolved, or the owner/operator obtains a permit modification in accordance with the procedures of part (9)(c)5 of Rule 1200-1-11-.07 specifically authorizing receipt of the waste.
 - (vi) As part of the permit issuance or permit modification process of part 4 of this subparagraph, the Commissioner may modify, reduce, or eliminate the notification requirements of this subparagraph as they apply to specific categories of CAMU-eligible waste, based on minimal risk.
6. Generators of CAMU-eligible wastes sent off-site to a hazardous waste landfill under this subparagraph must comply with the requirements of subpart (1)(g)1(iv) of Rule 1200-1-

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11-10; off-site facilities treating CAMU-eligible wastes to comply with this subparagraph must comply with the requirements of subpart (1)(g)2(iv) of Rule 1200-1-11-.10 , except that the certification must be with respect to the treatment requirements of subpart 1(ii) of this subparagraph.

7. For the purposes of this subparagraph only, the “design of the CAMU” in subitem (c)5(iv)(V)V of this Rule means design of the permitted Subtitle C landfill.

(23)-(25) (RESERVED) [40 CFR 264 Subparts T-V]

(26) Drip Pads [40 CFR 264 Subpart W]

(a) Applicability [40 CFR 264.570]

1. The requirements of this paragraph apply to owners and operators of facilities that use new or existing drip pads to convey treated wood drippage, precipitation, and/or surface water run-off to an associated collection system. Existing drip pads are those constructed before December 6, 1990 and those for which the owner or operator has a design and has entered into binding financial or other agreements for construction prior to December 6, 1990. All other drip pads are new drip pads. The requirement at subpart (d)2(iii) of this paragraph to install a leak collection system applies only to those drip pads that are constructed after December 24, 1992 except for those constructed after December 24, 1992 for which the owner or operator has a design and has entered into binding financial or other agreements for construction prior to December 24, 1992.
2. The owner or operator of any drip pad that is inside or under a structure that provides protection from precipitation so that neither run-off nor run-on is generated is not subject to regulation under parts (d)5 or 6 of this paragraph, as appropriate.
3. The requirements of this subpart are not applicable to the management of infrequent and incidental drippage in storage yards provided that:
 - (i) The owner or operator maintains and complies with a written contingency plan that describes how the owner or operator will respond immediately to the discharge of such infrequent and incidental drippage. At a minimum, the contingency plan must describe how the owner or operator will do the following:
 - (I) Clean up the drippage;
 - (II) Document the cleanup of the drippage;
 - (III) Retain documents regarding cleanup for three years; and
 - (IV) Manage the contaminated media in a manner consistent with Federal regulations.

(b) Assessment of Existing Drip Pad Integrity [40 CFR 264.571]

1. For each existing drip pad as defined in subparagraph (a) of this paragraph, the owner or operator must evaluate the drip pad and determine that it meets all of the requirements of this subpart, except the requirements for liners and leak detection systems of part (d)2 of this paragraph. No later than the effective date of this rule, the owner or operator must obtain and keep on file at the facility a written assessment of the drip pad, reviewed and

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certified by an independent, qualified registered professional engineer that attests to the results of the evaluation. The assessment must be reviewed, updated and re-certified annually until all upgrades, repairs, or modifications necessary to achieve compliance with all of the standards of subparagraph (d) of this paragraph are complete. The evaluation must document the extent to which the drip pad meets each of the design and operating standards of subparagraph (d) of this paragraph, except the standards for liners and leak detection systems, specified in part (d)2 of this paragraph.

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2. The owner or operator must develop a written plan for upgrading, repairing, and modifying the drip pad to meet the requirements of part (d)2 of this paragraph, and submit the plan to the Commissioner no later than 2 years before the date that all repairs, upgrades, and modifications are complete. This written plan must describe all changes to be made to the drip pad in sufficient detail to document compliance with all the requirements of subparagraph (d) of this paragraph. The plan must be reviewed and certified by an independent qualified registered professional engineer.
3. Upon completion of all upgrades, repairs, and modifications, the owner or operator must submit to the Commissioner, the as-built drawings for the drip pad together with a certification by an independent qualified registered professional engineer attesting that the drip pad conforms to the drawings.
4. If the drip pad is found to be leaking or unfit for use, the owner or operator must comply with the provisions of part (d)13 of this paragraph or close the drip pad in accordance with subparagraph (f) of this paragraph.

(c) Design and Installation of New Drip Pads [40 CFR 264.572]

Owners and operators of new drip pads must ensure that the pads are designed, installed, and operated in accordance with one of the following:

1. all of the requirements of subparagraph (d) of this paragraph (except subpart (d)1(iv)) and subparagraphs (e) and (f) of this paragraph, or
2. all of the requirements of subparagraph (d) of this paragraph (except part (d)2), and subparagraphs (e) and (f) of this paragraph.

(d) Design and Operating Requirements [40 CFR 264.573]

1. Drip pads must:
 - (i) Be constructed of non-earthern materials, excluding wood and non-structurally supported asphalt;
 - (ii) Be sloped to free-drain treated wood drippage, rain and other waters, or solutions of drippage and water or other wastes to the associated collection system;
 - (iii) Have a curb or berm around the perimeter;
 - (iv) (I) Have a hydraulic conductivity of less than or equal to 1×10^{-7} centimeters per second, e.g., existing concrete drip pads must be sealed, coated, or covered with a surface material with a hydraulic conductivity of less than or equal to 1×10^{-7} centimeters per second such that the entire surface where drippage occurs or may run across is

capable of containing such drippage and mixtures of drippage and precipitation, materials, or other wastes while being routed to an associated collection system. This surface material must be maintained free of cracks and gaps that could adversely affect its hydraulic conductivity, and the material must be chemically compatible with the preservatives that contact the drip pad. The requirements of this provision apply only to existing drip pads and those drip pads for which the owner or operator elects to comply with part (c)1 instead of part (c)2 of this paragraph.

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- (II) The owner or operator must obtain and keep on file at the facility a written assessment of the drip pad, reviewed and certified by an independent, qualified registered professional engineer that attests to the results of the evaluation. The assessment must be reviewed, updated and recertified annually. The evaluation must document the extent to which the drip pad meets the design and operating standards of this section, except for part 2 of this subparagraph.
- (v) Be of sufficient structural strength and thickness to prevent failure due to physical contact, climatic conditions, the stress of daily perations, e.g., variable and moving loads such as vehicle traffic, movement of wood, etc.

(Note: The Commissioner will generally consider applicable standards established by professional organizations generally recognized by the industry such as the American Concrete Institute (ACI) or the American Society of Testing and Materials (ASTM) in judging the structural integrity requirement of this subparagraph.)

- 2. If an owner/operator elects to comply with part (c)2 instead of part (c)1 of this paragraph, the drip pad must have:

- (i) A synthetic liner installed below the drip pad that is designed, constructed, and installed to prevent leakage from the drip pad into the adjacent subsurface soil or groundwater or surface water at any time during the active life (including the closure period) of the drip pad. The liner must be constructed of materials that will prevent waste from being absorbed into the liner and to prevent releases into the adjacent subsurface soil or groundwater or surface water during the active life of the facility. The liner must be:
 - (I) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or drip pad leakage to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation (including stresses from vehicular traffic on the drip pad);
 - (II) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression or uplift; and
 - (III) Installed to cover all surrounding earth that could come in contact with the waste or leakage; and

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- (ii) A leakage detection system immediately above the liner that is designed, constructed, maintained and operated to detect leakage from the drip pad. The leakage detection system must be:
 - (I) Constructed of materials that are:
 - I. Chemically resistant to the waste managed in the drip pad and the leakage that might be generated; and
 - II. Of sufficient strength and thickness to prevent collapse under the pressures exerted by overlaying materials and by any equipment used at the drip pad;
 - (II) Designed and operated to function without clogging through the scheduled closure of the drip pad; and
 - (III) Designed so that it will detect the failure of the drip pad or the presence of a release of hazardous waste or accumulated liquid at the earliest practicable time.
 - (iii) A leakage collection system immediately above the liner that is designed, constructed, maintained and operated to collect leakage from the drip pad such that it can be removed from below the drip pad. The date, time, and quantity of any leakage collected in this system and removed must be documented in the operating log.
3. Drip pads must be maintained such that they remain free of cracks, gaps, corrosion, or other deterioration that could cause hazardous waste to be released from the drip pad.

(Note: See part 13 of this subparagraph for remedial action required if deterioration or leakage is detected.)

- 4. The drip pad and associated collection system must be designed and operated to convey, drain, and collect liquid resulting from drippage or precipitation in order to prevent run-off.
- 5. Unless protected by a structure, as described in part (a)2 of this paragraph, the owner or operator must design, construct, operate and maintain a run-on control system capable of preventing flow onto the drip pad during peak discharge from at least a 24-hour, 25-year storm, unless the system has sufficient excess capacity to contain any run-off that might enter the system.
- 6. Unless protected by a structure or cover as described in part (a)2 of this paragraph, the owner or operator must design, construct, operate and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 25-year storm.
- 7. The drip pad must be evaluated to determine that it meets the requirements of parts 1 through 6 of this subparagraph and the owner or operator must obtain a statement from an independent, qualified registered professional engineer certifying that the drip pad design meets the requirements of this subparagraph.
- 8. Drippage and accumulated precipitation must be removed from the associated collection system as necessary to prevent overflow onto the drip pad.

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9. The drip pad surface must be cleaned thoroughly in a manner and frequency such that accumulated residues of hazardous waste or other materials are removed, with residues being properly managed as hazardous waste, so as to allow weekly inspections of the entire drip pad surface without interference or hindrance from accumulated residues of hazardous waste or other materials on the drip pad. The owner or operator must document the date and time of each cleaning and the cleaning procedure used in the facility's operating log. The owner/operator must determine if the residues are hazardous as per Rule 1200-1-11-.03(1)(b) and, if so, must manage them under Rules 1200-1-11-.02-.07, .09 and .10, and section 3010 of RCRA.
10. Drip pads must be operated and maintained in a manner to minimize tracking of hazardous waste or hazardous waste constituents off the drip pad as a result of activities by personnel or equipment.
11. After being removed from the treatment vessel, treated wood from pressure and non-pressure processes must be held on the drip pad until drippage has ceased. The owner or operator must maintain records sufficient to document that all treated wood is held on the pad following treatment in accordance with this requirement.
12. Collection and holding units associated with run-on and run-off control systems must be emptied or otherwise managed as soon as possible after storms to maintain design capacity of the system.
13. Throughout the active life of the drip pad and as specified in the permit, if the owner or operator detects a condition that may have caused or has caused a release of hazardous waste, the condition must be repaired within a reasonably prompt period of time following discovery, in accordance with the following procedures:
 - (i) Upon detection of a condition that may have caused or has caused a release of hazardous waste (e.g., upon detection of leakage in the leak detection system), the owner or operator must:
 - (I) Enter a record of the discovery in the facility operating log;
 - (II) Immediately remove the portion of the drip pad affected by the condition from service;
 - (III) Determine what steps must be taken to repair the drip pad and clean up any leakage from below the drip pad, and establish a schedule for accomplishing the repairs;
 - (IV) Within 24 hours after discovery of the condition, notify the Commissioner of the condition and, within 10 working days, provide written notice to the Commissioner with a description of the steps that will be taken to repair the drip pad and clean up any leakage, and the schedule for accomplishing this work.
 - (ii) The Commissioner will review the information submitted, make a determination regarding whether the pad must be removed from service completely or partially until repairs and clean up are complete and notify the owner or operator of the determination and the underlying rationale in writing.
 - (iii) Upon completing all repairs and clean up, the owner or operator must notify the Commissioner in writing and provide a certification signed by an independent,

qualified registered professional engineer, that the repairs and clean up have been completed according to the written plan submitted in accordance with item (i)(IV) of this part.

14. Should a permit be necessary, the Commissioner will specify in the permit all design and operating practices that are necessary to ensure that the requirements of this section are satisfied.
15. The owner or operator must maintain, as part of the facility operating log, documentation of past operating and waste handling practices. This must include identification of preservative formulations used in the past, a description of drippage management practices, and a description of treated wood storage and handling practices.

(e) Inspections [40 CFR 264.574]

1. During construction or installation, liners and cover systems (e.g., membranes, sheets, or coatings) must be inspected for uniformity, damage and imperfections (e.g., holes, cracks, thin spots, or foreign materials). Immediately after construction or installation, liners must be inspected and certified as meeting the requirements of subparagraph (d) of this paragraph by an independent qualified, registered professional engineer. This certification must be maintained at the facility as part of the facility operating record. After installation, liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters.
2. While a drip pad is in operation, it must be inspected weekly and after storms to detect evidence of any of the following:
 - (i) Deterioration, malfunctions or improper operation of run-on and run-off control systems;
 - (ii) The presence of leakage in and proper functioning of leak detection system.
 - (iii) Deterioration or cracking of the drip pad surface.

(Note: See part (d)13 of this paragraph for remedial action required if deterioration or leakage is detected.)

(f) Closure [40 CFR 264.575]

1. At closure, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (pad, liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leakage, and manage them as hazardous waste.
2. If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, subsoils, structures, and equipment as required in part 1 of this subparagraph, the owner or operator finds that not all contaminated subsoils can be practicably removed or decontaminated, he must close the facility and perform post-closure care in accordance with closure and post-closure care requirements that apply to landfills (subparagraph (14)(k) of this Rule). For permitted units, the requirement to have a permit continues throughout the post-closure period. In addition, for the purpose of closure, post-closure, and financial responsibility, such a drip pad is then considered to be landfill, and the owner or operator must meet all of the requirements for landfills specified in paragraphs (7) and (8) of this Rule.

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3. (i) The owner or operator of an existing drip pad, as defined in subparagraph (a) of this paragraph, that does not comply with the liner requirements of subpart (d)2(i) of this paragraph must:
 - (I) Include in the closure plan for the drip pad under subparagraph (7)(c) of this Rule both a plan for complying with part 1 of this subparagraph and a contingent plan for complying with part 2 of this subparagraph in case not all contaminated subsoils can be practicably removed at closure; and
 - (II) Prepare a contingent post-closure plan under subparagraph 7(i) of this Rule for complying with part 2 of this subparagraph in case not all contaminated subsoils can be practicably removed at closure.
- (ii) The cost estimates calculated under subparagraphs (7)(c) and (8)(e) of this Rule for closure and post-closure care of a drip pad subject to this paragraph must include the cost of complying with the contingent closure plan and the contingent post-closure plan, but are not required to include the cost of expected closure under part 1 of this subparagraph.

(27) Miscellaneous Units [40 CFR 264 Subpart X]

(a) Applicability [40 CFR 264.600]

The requirements in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous waste in miscellaneous units, except as paragraph (1) of this Rule provide otherwise.

(b) Environmental Performance Standards [40 CFR 264.601]

A miscellaneous unit must be located, designed, constructed, operated, maintained, and closed in a manner that will ensure protection of human health and the environment. Permits for miscellaneous units are to contain such terms and provisions as necessary to protect human health and the environment, including, but not limited to, as appropriate, design and operating requirements, detection and monitoring requirements, and requirements for responses to releases of hazardous waste or hazardous constituents from the unit. Permit terms and provisions must include those requirements of paragraphs (9)-(15), (30), (31), and (32) of this Rule, Rule 1200-1-11-.07, 40 CFR 63 Subpart EEE, and 40 CFR 146 that are appropriate for the miscellaneous unit being permitted. Protection of human health and the environment includes, but is not limited to:

1. Prevention of any releases that may have adverse effects on human health or the environment due to migration of waste constituents in the ground water or subsurface environment, considering:
 - (i) The volume and physical and chemical characteristics of the waste in the unit, including its potential for migration through soil, liners, or other containing structures;
 - (ii) The hydrologic and geologic characteristics of the unit and the surrounding area;
 - (iii) The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground water;

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- (iv) The quantity and direction of ground-water flow;
 - (v) The proximity to and withdrawal rates of current and potential ground-water users;
 - (vi) The patterns of land use in the region;
 - (vii) The potential for deposition or migration of waste constituents into subsurface physical structures, and into the root zone of food-chain crops and other vegetation;
 - (viii) The potential for health risks caused by human exposure to waste constituents; and
 - (ix) The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;
2. Prevention of any releases that may have adverse effects on human health or the environment due to migration of waste constituents in surface water, or wetlands or on the soil surface considering:
- (i) The volume and physical and chemical characteristics of the waste in the unit;
 - (ii) The effectiveness and reliability of containing, confining, and collecting systems and structures in preventing migration;
 - (iii) The hydrologic characteristics of the unit and the surrounding area, including the topography of the land around the unit;
 - (iv) The patterns of precipitation in the region;
 - (v) The quantity, quality, and direction of ground-water flow;
 - (vi) The proximity of the unit to surface waters;
 - (vii) The current and potential uses of nearby surface waters and any water quality standards established for those surface waters;
 - (viii) The existing quality of surface waters and surface soils, including other sources of contamination and their cumulative impact on surface waters and surface soils;
 - (ix) The patterns of land use in the region;
 - (x) The potential for health risks caused by human exposure to waste constituents; and
 - (xi) The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.
3. Prevention of any release that may have adverse effects on human health or the environment due to migration of waste constituents in the air, considering:

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- (i) The volume and physical and chemical characteristics of the waste in the unit, including its potential for the emission and dispersal of gases, aerosols and particulates;
 - (ii) The effectiveness and reliability of systems and structures to reduce or prevent emissions of hazardous constituents to the air;
 - (iii) The operating characteristics of the unit;
 - (iv) The atmospheric, meteorologic, and topographic characteristics of the unit and the surrounding area;
 - (v) The existing quality of the air, including other sources of contamination and their cumulative impact on the air;
 - (vi) The potential for health risks caused by human exposure to waste constituents; and
 - (vii) The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.
- (c) Monitoring, Analysis, Inspection, Response, Reporting, and Corrective Action [40 CFR 264.602]
- Monitoring, testing, analytical data, inspections, response, and reporting procedures and frequencies must ensure compliance with subparagraph (b) of this paragraph, and subparagraphs (2)(f), (3)(d), (5)(f) and (g) and (h), and (6)(l) of this Rule as well as meet any additional requirements needed to protect human health and the environment as specified in the permit.
- (d) Post-closure Care [40 CFR 264.603]
- A miscellaneous unit that is a disposal unit must be maintained in a manner that complies with subparagraph (b) of this paragraph during the post-closure care period. In addition, if a treatment or storage unit has contaminated soils or ground water that cannot be completely removed or decontaminated during closure, then that unit must also meet the requirements of subparagraph (b) of this paragraph during post-closure care. The post-closure plan under subparagraph (7)(i) of this Rule must specify the procedures that will be used to satisfy this requirement.
- (28)-(29) (RESERVED) [40 CFR 264 Subparts Y and Z]
- (30) Air Emission Standards for Process Vents [40 CFR 264 Subpart AA]
- (a) Applicability [40 CFR 264.1030]
 - 1. The regulations in this subparagraph apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes except as provided in subparagraph (1)(b) of this Rule.
 - 2. Except for parts (e)4 and (e)5 of this paragraph, this paragraph applies to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that manage hazardous wastes with organic concentrations of at least 10 ppmw, if these operations are conducted in one of the following:
 - (i) A unit that is subject to the permitting requirements of Rule 1200-1-11-.07, or

- (ii) A unit (including a hazardous waste recycling unit) that is not exempt from permitting under the provisions of Rule 1200-1-11-.03(4)(e)2 (i.e., a hazardous waste recycling unit that is not a 90-day tank or container) and that is located at a hazardous waste management facility otherwise subject to the permitting requirements of Rule 1200-1-11-.07, or
- (iii) A unit that is exempt from permitting under the provisions of Rule 1200-1-11-.03(4)(e)2 (i.e., a "90-day" tank or container) and is not a recycling unit under the provisions of Rule 1200-1-11-.02(1)(f).
3. For the owner or operator of a facility subject to this paragraph and who received a final permit under RCRA section 3005 and/or T.C.A. §68-212-108 prior to December 6, 1996, the requirements of this paragraph shall be incorporated into the permit when the permit is reissued in accordance the requirements of Rule 1200-1-11-.07(7)(i) or reviewed in accordance with the requirements of Rule 1200-1-11-.07(8)(c)4. Until such date when the owner and operator receives a final permit incorporating the requirements of this paragraph, the owner and operator is subject to the requirements of Rule 1200-1-11-.05(27).
4. (Reserved) [40 CFR 264.1030(d)]
5. The requirements of this paragraph do not apply to the process vents at a facility where the facility owner or operator certifies that all of the process vents that would otherwise be subject to this paragraph are equipped with and operating air emission controls in accordance with the process vent requirements of an applicable Clean Air Act regulation codified under 40 CFR part 60, part 61, or part 63. The documentation of compliance under regulations at 40 CFR part 60, part 61, or part 63 shall be kept with, or made readily available with, the facility operating record.

(Note: The requirements of subparagraphs (c) through (g) of this paragraph apply to process vents on hazardous waste recycling units previously exempt under Rule 1200-1-11-.02(1)(f)3(i). Other exemptions under Rules 1200-1-11-.02(1)(d), .03(4)(e), and .06(1)(b)7 are not affected by these requirements.)

(b) Definitions [40 CFR 264.1031]

As used in this paragraph, all terms not defined herein shall have the meaning given them in Tennessee Code Annotated §§68-212-101 et seq. and Rules 1200-1-11-.01 through .06 and .09.

"Air stripping operation" is a desorption operation employed to transfer one or more volatile components from a liquid mixture into a gas (air) either with or without the application of heat to the liquid. Packed towers, spray towers, and bubble-cap, sieve, or valve-type plate towers are among the process configurations used for contacting the air and a liquid.

"Bottoms receiver" means a container or tank used to receive and collect the heavier bottoms fractions of the distillation feed stream that remain in the liquid phase.

"Closed-vent system" means a system that is not open to the atmosphere and that is composed of piping, connections, and, if necessary, flow-inducing devices that transport gas or vapor from a piece or pieces of equipment to a control device.

"Condenser" means a heat-transfer device that reduces a thermodynamic fluid from its vapor phase to its liquid phase.

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"Connector" means flanged, screwed, welded, or other joined fittings used to connect two pipelines or a pipeline and a piece of equipment. For the purposes of reporting and recordkeeping, connector means flanged fittings that are not covered by insulation or other materials that prevent location of the fittings.

"Continuous recorder" means a data-recording device recording an instantaneous data value at least once every 15 minutes.

"Control device" means an enclosed combustion device, vapor recovery system, or flare. Any device the primary function of which is the recovery or capture of solvents or other organics for use, reuse, or sale (e.g., a primary condenser on a solvent recovery unit) is not a control device.

"Control device shutdown" means the cessation of operation of a control device for any purpose.

"Distillate receiver" means a container or tank used to receive and collect liquid material (condensed) from the overhead condenser of a distillation unit and from which the condensed liquid is pumped to larger storage tanks or other process units.

"Distillation operation" means an operation, either batch or continuous, separating one or more feed stream(s) into two or more exit streams, each exit stream having component concentrations different from those in the feed stream(s). The separation is achieved by the redistribution of the components between the liquid and vapor phase as they approach equilibrium within the distillation unit.

"Double block and bleed system" means two block valves connected in series with a bleed valve or line that can vent the line between the two block valves.

"Equipment" means each valve, pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, or flange or other connector, and any control devices or systems required by this subpart.

"Flame zone" means the portion of the combustion chamber in a boiler occupied by the flame envelope.

"Flow indicator" means a device that indicates whether gas flow is present in a vent stream.

"First attempt at repair" means to take rapid action for the purpose of stopping or reducing leakage of organic material to the atmosphere using best practices.

"Fractionation operation" means a distillation operation or method used to separate a mixture of several volatile components of different boiling points in successive stages, each stage removing from the mixture some proportion of one of the components.

"Hazardous waste management unit shutdown" means a work practice or operational procedure that stops operation of a hazardous waste management unit or part of a hazardous waste management unit. An unscheduled work practice or operational procedure that stops operation of a hazardous waste management unit or part of a hazardous waste management unit for less than 24 hours is not a hazardous waste management unit shutdown. The use of spare equipment and technically feasible bypassing of equipment without stopping operation are not hazardous waste management unit shutdowns.

"Hot well" means a container for collecting condensate as in a steam condenser serving a vacuum-jet or steam-jet ejector.

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"In gas/vapor service" means that the piece of equipment contains or contacts a hazardous waste stream that is in the gaseous state at operating conditions.

"In heavy liquid service" means that the piece of equipment is not in gas/vapor service or in light liquid service.

"In light liquid service" means that the piece of equipment contains or contacts a waste stream where the vapor pressure of one or more of the organic components in the stream is greater than 0.3 kilopascals (kPa) at 20 °C, the total concentration of the pure organic components having a vapor pressure greater than 0.3 kPa at 20 °C is equal to or greater than 20 percent by weight, and the fluid is a liquid at operating conditions.

"In situ sampling systems" means nonextractive samplers or in-line samplers.

"In vacuum service" means that equipment is operating at an internal pressure that is at least 5 kPa below ambient pressure.

"Malfunction" means any sudden failure of a control device or a hazardous waste management unit or failure of a hazardous waste management unit to operate in a normal or usual manner, so that organic emissions are increased.

"Open-ended valve or line" means any valve, except pressure relief valves, having one side of the valve seat in contact with hazardous waste and one side open to the atmosphere, either directly or through open piping.

"Pressure release" means the emission of materials resulting from the system pressure being greater than the set pressure of the pressure relief device.

"Process heater" means a device that transfers heat liberated by burning fuel to fluids contained in tubes, including all fluids except water that are heated to produce steam.

"Process vent" means any open-ended pipe or stack that is vented to the atmosphere either directly, through a vacuum-producing system, or through a tank (e.g., distillate receiver, condenser, bottoms receiver, surge control tank, separator tank, or hot well) associated with hazardous waste distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations.

"Repaired" means that equipment is adjusted, or otherwise altered, to eliminate a leak.

"Sampling connection system" means an assembly of equipment within a process or waste management unit used during periods of representative operation to take samples of the process or waste fluid. Equipment used to take non-routine grab samples is not considered a sampling connection system.

"Sensor" means a device that measures a physical quantity or the change in a physical quantity, such as temperature, pressure, flow rate, pH, or liquid level.

"Separator tank" means a device used for separation of two immiscible liquids.

"Solvent extraction operation" means an operation or method of separation in which a solid or solution is contacted with a liquid solvent (the two being mutually insoluble) to preferentially dissolve and transfer one or more components into the solvent.

"Startup" means the setting in operation of a hazardous waste management unit or control device for any purpose.

"Steam stripping operation" means a distillation operation in which vaporization of the volatile constituents of a liquid mixture takes place by the introduction of steam directly into the charge.

"Surge control tank" means a large-sized pipe or storage reservoir sufficient to contain the surging liquid discharge of the process tank to which it is connected.

"Thin-film evaporation operation" means a distillation operation that employs a heating surface consisting of a large diameter tube that may be either straight or tapered, horizontal or vertical. Liquid is spread on the tube wall by a rotating assembly of blades that maintain a close clearance from the wall or actually ride on the film of liquid on the wall.

"Vapor incinerator" means any enclosed combustion device that is used for destroying organic compounds and does not extract energy in the form of steam or process heat.

"Vented" means discharged through an opening, typically an open-ended pipe or stack, allowing the passage of a stream of liquids, gases, or fumes into the atmosphere. The passage of liquids, gases, or fumes is caused by mechanical means such as compressors or vacuum-producing systems or by process-related means such as evaporation produced by heating and not caused by tank loading and unloading (working losses) or by natural means such as diurnal temperature changes.

(c) Standards: Process Vents [40 CFR 264.1032]

1. The owner or operator of a facility with process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations managing hazardous wastes with organic concentrations of at least 10 ppmw shall either:
 - (i) Reduce total organic emissions from all affected process vents at the facility below 1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 tons/yr), or
 - (ii) Reduce, by use of a control device, total organic emissions from all affected process vents at the facility by 95 weight percent.
2. If the owner or operator installs a closed-vent system and control device to comply with the provisions of part 1 of this subparagraph the closed-vent system and control device must meet the requirements of subparagraph (d) of this paragraph.
3. Determinations of vent emissions and emission reductions or total organic compound concentrations achieved by add-on control devices may be based on engineering calculations or performance tests. If performance tests are used to determine vent emissions, emission reductions, or total organic compound concentrations achieved by add-on control devices, the performance tests must conform with the requirements of part (e)3 of this paragraph.
4. When an owner or operator and the Commissioner do not agree on determinations of vent emissions and/or emission reductions or total organic compound concentrations achieved by add-on control devices based on engineering calculations, the procedures in part (e)3 of this paragraph shall be used to resolve the disagreement.

(d) Standards: Closed-vent Systems and Control Devices [40 CFR 264.1033]

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1.
 - (i) Owners or operators of closed-vent systems and control devices used to comply with provisions of this part shall comply with the provisions of this subparagraph.
 - (ii)
 - (I) The owner or operator of an existing facility who cannot install a closed-vent system and control device to comply with the provisions of this paragraph on the effective date that the facility becomes subject to the provisions of this paragraph must prepare an implementation schedule that includes dates by which the closed-vent system and control device will be installed and in operation. The controls must be installed as soon as possible, but the implementation schedule may allow up to 30 months after the effective date that the facility becomes subject to this paragraph for installation and startup.
 - (II) Any unit that begins operation after December 21, 1990, and is subject to the provisions of this paragraph when operation begins, must comply with the rules immediately (i.e., must have control devices installed and operating on startup of the affected unit); the 30-month implementation schedule does not apply.
 - (III) The owner or operator of any facility in existence on the effective date of a statutory or regulatory amendment that renders the facility subject to this paragraph shall comply with all requirements of this paragraph as soon as practicable but no later than 30 months after the amendment's effective date. When control equipment required by this paragraph can not be installed and begin operation by the effective date of the amendment, the facility owner or operator shall prepare an implementation schedule that includes the following information: Specific calendar dates for award of contracts or issuance of purchase orders for the control equipment, initiation of on-site installation of the control equipment, completion of the control equipment installation, and performance of any testing to demonstrate that the installed equipment meets the applicable standards of this paragraph. The owner or operator shall enter the implementation schedule in the operating record or in a permanent, readily available file located at the facility.
 - (IV) Owners and operators of facilities and units that become newly subject to the requirements of this paragraph after December 8, 1997, due to an action other than those described in item 1(ii)(III) of this subparagraph must comply with all applicable requirements immediately (i.e., must have control devices installed and operating on the date the facility or unit becomes subject to this paragraph; the 30-month implementation schedule does not apply).
2. A control device involving vapor recovery (e.g., a condenser or adsorber) shall be designed and operated to recover the organic vapors vented to it with an efficiency of 95

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weight percent or greater unless the total organic emission limits of subpart (c)1(i) of this paragraph for all affected process vents can be attained at an efficiency less than 95 weight percent.

3. An enclosed combustion device (e.g., a vapor incinerator, boiler, or process heater) shall be designed and operated to reduce the organic emissions vented to it by 95 weight percent or greater; to achieve a total organic compound concentration of 20 ppmv, expressed as the sum of the actual compounds, not carbon equivalents, on a dry basis corrected to 3 percent oxygen; or to provide a minimum residence time of 0.50 seconds at a minimum temperature of 760 °C. If a boiler or process heater is used as the control device, then the vent stream shall be introduced into the flame zone of the boiler or process heater.
4.
 - (i) A flare shall be designed for and operated with no visible emissions as determined by the methods specified in subpart 5(i) of this subparagraph, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.
 - (ii) A flare shall be operated with a flame present at all times, as determined by the methods specified in item 6(ii)(III) of this subparagraph.
 - (iii) A flare shall be used only if the net heating value of the gas being combusted is 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or if the net heating value of the gas being combusted is 7.45 MJ/scm (200 Btu/scf) or greater if the flare is nonassisted. The net heating value of the gas being combusted shall be determined by the methods specified in subpart 5(ii) of this subparagraph.
 - (iv)
 - (I) A steam-assisted or nonassisted flare shall be designed for and operated with an exit velocity, as determined by the methods specified in subpart 5(iii) of this subparagraph, less than 18.3 m/s (60 ft/s), except as provided in items (iv)(II) and (III) of this part.
 - (II) A steam-assisted or nonassisted flare designed for and operated with an exit velocity, as determined by the methods specified in subpart 5(iii) of this subparagraph, equal to or greater than 18.3 m/s (60 ft/s) but less than 122 m/s (400 ft/s) is allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).
 - (III) A steam-assisted or nonassisted flare designed for and operated with an exit velocity, as determined by the methods specified in subpart 5(iii) of this subparagraph, less than the velocity, V_{\max} , as determined by the method specified in subpart 5(iv) of this subparagraph and less than 122 m/s (400 ft/s) is allowed.
 - (v) An air-assisted flare shall be designed and operated with an exit velocity less than the velocity, V_{\max} , as determined by the method specified in subpart 5(v) of this subparagraph.
 - (vi) A flare used to comply with this subparagraph shall be steam-assisted, air-assisted, or nonassisted.

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5. (i) Reference Method 22 in 40 CFR part 60 shall be used to determine the compliance of a flare with the visible emission provisions of this paragraph. The observation period is 2 hours and shall be used according to Method 22.
- (ii) The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K \left[\sum_{i=1}^n C_i H_i \right]$$

where:

H_T = Net heating value of the sample, MJ/scm; where the net enthalpy per mole of offgas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to 1 mol is 20 °C;

K = Constant, 1.74×10^{-7} (1/ppm) (g mol/scm) (MJ/kcal) where standard temperature for (g mol/scm) is 20 °C;

C_i = Concentration of sample component i in ppm on a wet basis, as measured for organics by Reference Method 18 in 40 CFR part 60 and measured for hydrogen and carbon monoxide by ASTM D 1946-82 (See Rule 1200-1-11-.01(2)(b)); and

H_i = Net heat of combustion of sample component i, kcal/9 mol at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D 2382-83 (See Rule 1200-1-11-.01(2)(b)) if published values are not available or cannot be calculated.

- (iii) The actual exit velocity of a flare shall be determined by dividing the volumetric flow rate (in units of standard temperature and pressure), as determined by Reference Methods 2, 2A, 2C, or 2D in 40 CFR part 60 as appropriate, by the unobstructed (free) cross-sectional area of the flare tip.

- (iv) The maximum allowed velocity in m/s, V_{\max} , for a flare complying with item 4(iv)(III) of this subparagraph shall be determined by the following equation:

$$\text{Log}_{10}(V_{\max}) = (H_T + 28.8) / 31.7$$

where:

28.8 = Constant,

31.7 = Constant,

H_T = The net heating value as determined in paragraph (e)(2) of this section.

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- (v) The maximum allowed velocity in m/s, V_{\max} , for an air-assisted flare shall be determined by the following equation:

$$V_{\max} = 8.706 + 0.7084 (H_T)$$

where:

$$8.706 = \text{Constant,}$$

$$0.7084 = \text{Constant,}$$

$$H_T = \text{The net heating value as determined in subpart 5(ii) of this subparagraph.}$$

6. The owner or operator shall monitor and inspect each control device required to comply with this section to ensure proper operation and maintenance of the control device by implementing the following requirements:

- (i) Install, calibrate, maintain, and operate according to the manufacturer's specifications a flow indicator that provides a record of vent stream flow from each affected process vent to the control device at least once every hour. The flow indicator sensor shall be installed in the vent stream at the nearest feasible point to the control device inlet but before the point at which the vent streams are combined.

- (ii) Install, calibrate, maintain, and operate according to the manufacturer's specifications a device to continuously monitor control device operation as specified below:

- (I) For a thermal vapor incinerator, a temperature monitoring device equipped with a continuous recorder. The device shall have an accuracy of ± 1 percent of the temperature being monitored in $^{\circ}\text{C}$ or ± 0.5 $^{\circ}\text{C}$, whichever is greater. The temperature sensor shall be installed at a location in the combustion chamber downstream of the combustion zone.

- (II) For a catalytic vapor incinerator, a temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature at two locations and have an accuracy of ± 1 percent of the temperature being monitored in $^{\circ}\text{C}$ or ± 0.5 $^{\circ}\text{C}$, whichever is greater. One temperature sensor shall be installed in the vent stream at the nearest feasible point to the catalyst bed inlet and a second temperature sensor shall be installed in the vent stream at the nearest feasible point to the catalyst bed outlet.

- (III) For a flare, a heat sensing monitoring device equipped with a continuous recorder that indicates the continuous ignition of the pilot flame.

- (IV) For a boiler or process heater having a design heat input capacity less than 44 MW, a temperature monitoring device equipped with a continuous recorder. The device shall have an accuracy of ± 1 percent of the temperature being monitored in $^{\circ}\text{C}$ or ± 0.5 $^{\circ}\text{C}$, whichever is

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greater. The temperature sensor shall be installed at a location in the furnace downstream of the combustion zone.

- (V) For a boiler or process heater having a design heat input capacity greater than or equal to 44 MW, a monitoring device equipped with a continuous recorder to measure a parameter(s) that indicates good combustion operating practices are being used.
- (VI) For a condenser, either:
 - I. A monitoring device equipped with a continuous recorder to measure the concentration level of the organic compounds in the exhaust vent stream from the condenser, or
 - II. A temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature with an accuracy of ± 1 percent of the temperature being monitored in degrees Celsius ($^{\circ}\text{C}$) or ± 0.5 $^{\circ}\text{C}$, whichever is greater. The temperature sensor shall be installed at a location in the exhaust vent stream from the condenser exit (i.e., product side).
- (VII) For a carbon adsorption system that regenerates the carbon bed directly in the control device such as a fixed-bed carbon adsorber, either:
 - I. A monitoring device equipped with a continuous recorder to measure the concentration level of the organic compounds in the exhaust vent stream from the carbon bed, or
 - II. A monitoring device equipped with a continuous recorder to measure a parameter that indicates the carbon bed is regenerated on a regular, predetermined time cycle.
- (iii) Inspect the readings from each monitoring device required by subparts (i) and (ii) of this part at least once each operating day to check control device operation and, if necessary, immediately implement the corrective measures necessary to ensure the control device operates in compliance with the requirements of this subparagraph.
- 7. An owner or operator using a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly onsite in the control device shall replace the existing carbon in the control device with fresh carbon at a regular, predetermined time interval that is no longer than the carbon service life established as a requirement of subitem (f)2(iv)(III)VI.
- 8. An owner or operator using a carbon adsorption system such as a carbon canister that does not regenerate the carbon bed directly onsite in the control device shall replace the existing carbon in the control device with fresh carbon on a regular basis by using one of the following procedures:
 - (i) Monitor the concentration level of the organic compounds in the exhaust vent stream from the carbon adsorption system on a regular schedule, and replace the existing carbon with fresh carbon immediately when carbon breakthrough is indicated. The monitoring frequency shall be daily or at an interval no greater

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than 20 percent of the time required to consume the total carbon working capacity established as a requirement of subitem (f)2(iv)(III)VII, whichever is longer.

- (ii) Replace the existing carbon with fresh carbon at a regular, predetermined time interval that is less than the design carbon replacement interval established as a requirement of subitem (f)2(iv)(III)VII.
- 9. An alternative operational or process parameter may be monitored if it can be demonstrated that another parameter will ensure that the control device is operated in conformance with these standards and the control device's design specifications.
- 10. An owner or operator of an affected facility seeking to comply with the provisions of this Rule by using a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system is required to develop documentation including sufficient information to describe the control device operation and identify the process parameter or parameters that indicate proper operation and maintenance of the control device.
- 11. A closed-vent system shall meet either of the following design requirements:
 - (i) Closed-vent systems shall be designed to operate with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background as determined by the procedure in part (e)2 of this paragraph, and by visual inspections; or
 - (ii) A closed-vent system shall be designed to operate at a pressure below atmospheric pressure. The system shall be equipped with at least one pressure gauge or other pressure measurement device that can be read from a readily accessible location to verify that negative pressure is being maintained in the closed-vent system when the control device is operating.
- 12. The owner or operator shall monitor and inspect each closed-vent system required to comply with this subparagraph to ensure proper operation and maintenance of the closed-vent system by implementing the following requirements:
 - (i) Each closed-vent system that is used to comply with subpart 11(i) of this subparagraph shall be inspected and monitored in accordance with the following requirements:
 - (I) An initial leak detection monitoring of the closed-vent system shall be conducted by the owner or operator on or before the date that the system becomes subject to this subparagraph. The owner or operator shall monitor the closed-vent system components and connections using the procedures specified in part (e)2 of this paragraph to demonstrate that the closed-vent system operates with no detectable emissions, as indicated by an instrument reading of less than 500 ppmv above background.
 - (II) After initial leak detection monitoring required in item (i)(I) of this part, the owner or operator shall inspect and monitor the closed-vent system as follows:

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- I. Closed-vent system joints, seams, or other connections that are permanently or semi-permanently sealed (e.g., a welded joint between two sections of hard piping or a bolted and gasketed ducting flange) shall be visually inspected at least once per year to check for defects that could result in air pollutant emissions. The owner or operator shall monitor a component or connection using the procedures specified in part (e)2 of this paragraph to demonstrate that it operates with no detectable emissions following any time the component is repaired or replaced (e.g., a section of damaged hard piping is replaced with new hard piping) or the connection is unsealed (e.g., a flange is unbolted).
 - II. Closed-vent system components or connections other than those specified in subitem (i)(II)I of this part shall be monitored annually and at other times as requested by the Commissioner, except as provided for in part 15 of this subparagraph, using the procedures specified in part (e)2 of this paragraph to demonstrate that the components or connections operate with no detectable emissions.
- (III) In the event that a defect or leak is detected, the owner or operator shall repair the defect or leak in accordance with the requirements of subpart (iii) of this part.
 - (IV) The owner or operator shall maintain a record of the inspection and monitoring in accordance with the requirements specified in subparagraph (f) of this paragraph.
- (ii) Each closed-vent system that is used to comply with subpart 11(ii) of this subparagraph shall be inspected and monitored in accordance with the following requirements:
 - (I) The closed-vent system shall be visually inspected by the owner or operator to check for defects that could result in air pollutant emissions. Defects include, but are not limited to, visible cracks, holes, or gaps in ductwork or piping or loose connections.
 - (II) The owner or operator shall perform an initial inspection of the closed-vent system on or before the date that the system becomes subject to this subparagraph. Thereafter, the owner or operator shall perform the inspections at least once every year.
 - (III) In the event that a defect or leak is detected, the owner or operator shall repair the defect in accordance with the requirements of subpart (iii) of this part.
 - (IV) The owner or operator shall maintain a record of the inspection and monitoring in accordance with the requirements specified in subparagraph (f) of this paragraph.
 - (iii) The owner or operator shall repair all detected defects as follows:

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- (I) Detectable emissions, as indicated by visual inspection, or by an instrument reading greater than 500 ppmv above background, shall be controlled as soon as practicable, but not later than 15 calendar days after the emission is detected, except as provided for in item (iii)(III) of this part.
 - (II) A first attempt at repair shall be made no later than 5 calendar days after the emission is detected.
 - (III) Delay of repair of a closed-vent system for which leaks have been detected is allowed if the repair is technically infeasible without a process unit shutdown, or if the owner or operator determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. Repair of such equipment shall be completed by the end of the next process unit shutdown.
 - (IV) The owner or operator shall maintain a record of the defect repair in accordance with the requirements specified in subparagraph (f) of this paragraph.
13. Closed-vent systems and control devices used to comply with provisions of this paragraph shall be operated at all times when emissions may be vented to them.
14. The owner or operator using a carbon adsorption system to control air pollutant emissions shall document that all carbon that is a hazardous waste and that is removed from the control device is managed in one of the following manners, regardless of the average volatile organic concentration of the carbon:
- (i) Regenerated or reactivated in a thermal treatment unit that meets one of the following:
 - (I) The owner or operator of the unit has been issued a final permit under Rule 1200-1-11-.07 which implements the requirements of paragraph (27) of this Rule; or
 - (II) The unit is equipped with and operating air emission controls in accordance with the applicable requirements of paragraphs (30) and (32) of this Rule or Rules 1200-1-11-.05(27 and (29); or
 - (III) The unit is equipped with and operating air emission controls in accordance with a national emission standard for hazardous air pollutants under 40 CFR part 61 or 40 CFR part 63.
 - (ii) Incinerated in a hazardous waste incinerator for which the owner or operator either:
 - (I) Has been issued a final permit under Rule 1200-1-11-.07 which implements the requirements of paragraph (15) of this Rule; or
 - (II) Has designed and operates the incinerator in accordance with the interim status requirements of Rule 1200-1-11-.05(15).
 - (iii) Burned in a boiler or industrial furnace for which the owner or operator either:

- (I) Has been issued a final permit under Rule 1200-1-11-.07 which implements the requirements of Rule 1200-1-11-.09(8); or
 - (II) Has designed and operates the boiler or industrial furnace in accordance with the interim status requirements of Rule 1200-1-11-.09(8).
- 15. Any components of a closed-vent system that are designated, as described in subpart (f)3(ix) of this paragraph, as unsafe to monitor are exempt from the requirements of subitem 12(i)(II)II of this subparagraph if:
 - (i) The owner or operator of the closed-vent system determines that the components of the closed-vent system are unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with subitem 12(i)(II)II of this subparagraph; and
 - (ii) The owner or operator of the closed-vent system adheres to a written plan that requires monitoring the closed-vent system components using the procedure specified in subitem 12(i)(II)II of this subparagraph as frequently as practicable during safe-to-monitor times.
- 16. The Reference Methods cited in preceding parts of this subparagraph are applicable as those methods exist on the effective date of these regulations.

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